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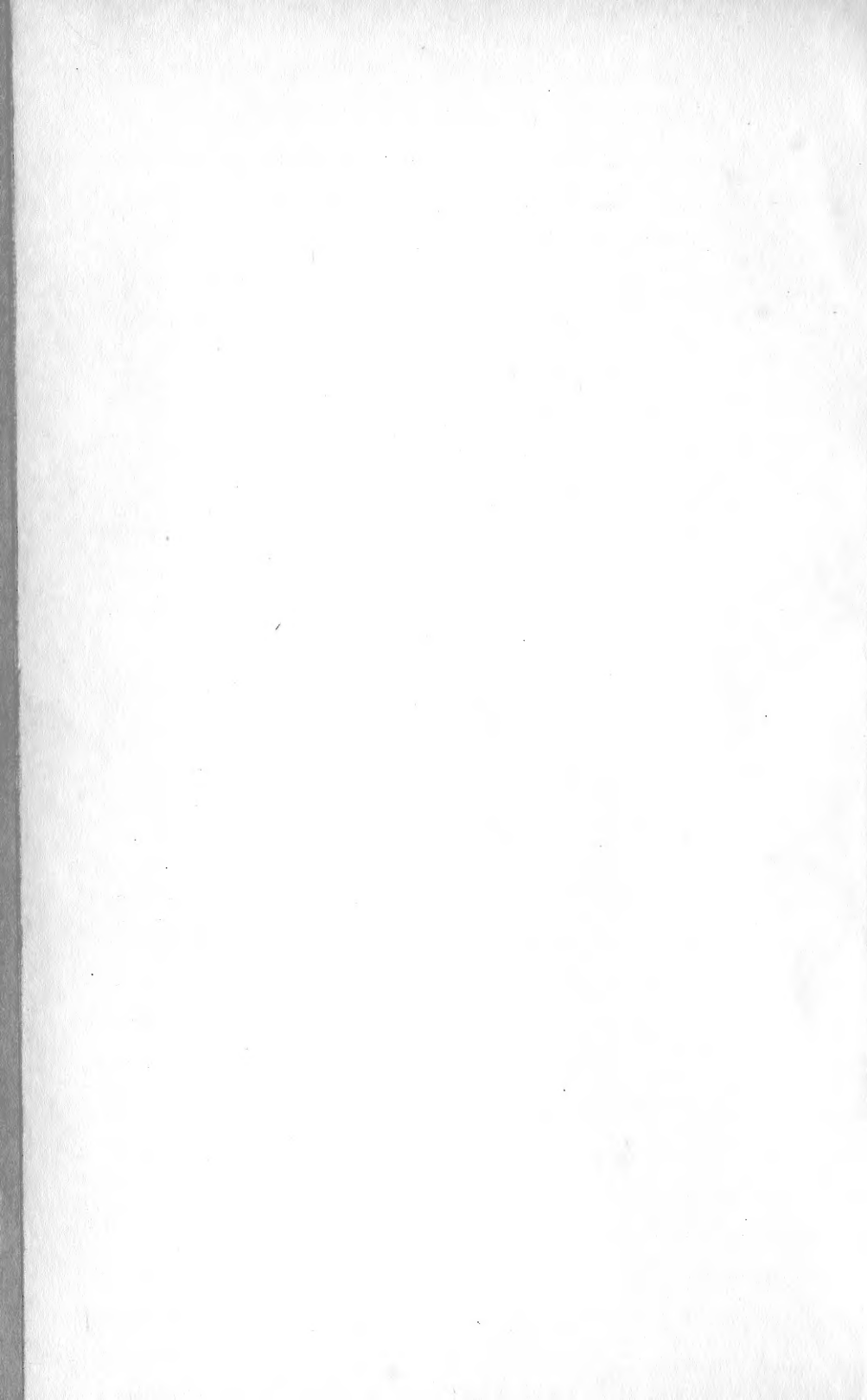
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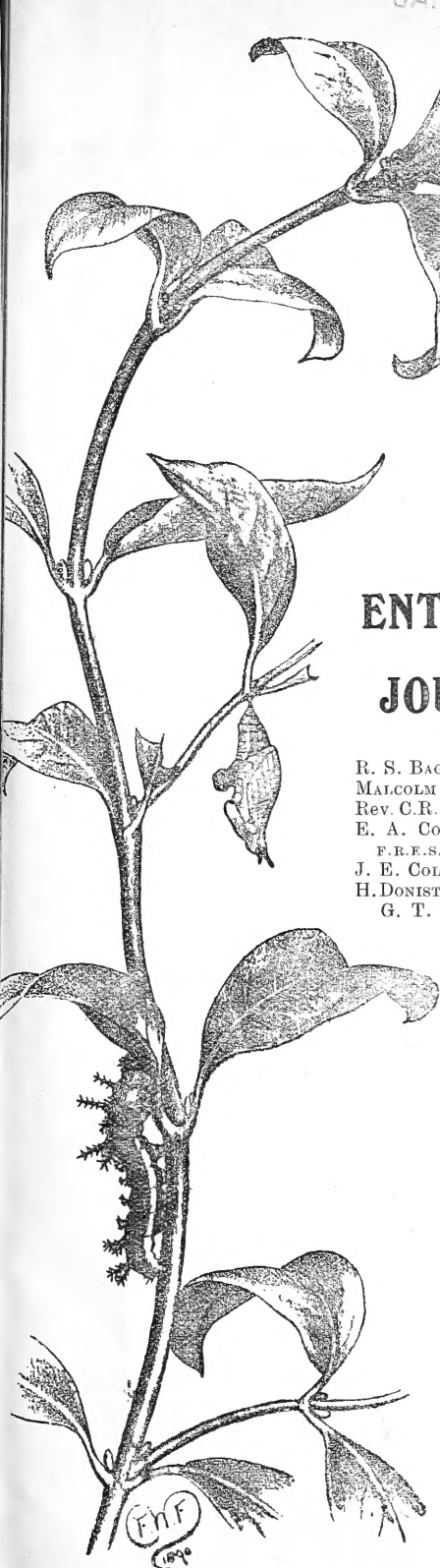
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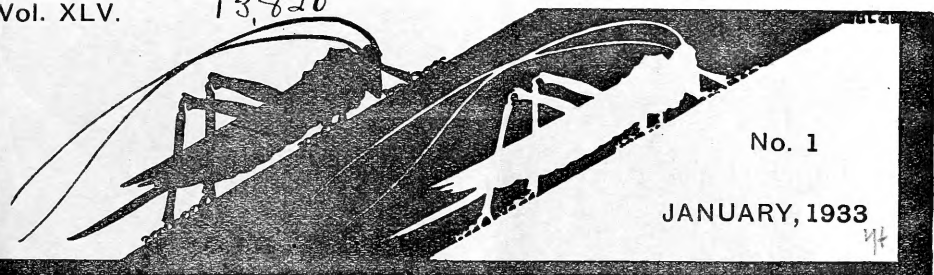
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VOL. XLV. No. 1.

JANUARY 15TH, 1933.

Erebiidae and Lycaenidae from Southern Austria.

By F. B. WELCH and A. E. WELCH.

The following notes of a visit to Styria and Carinthia in the month of July, 1931, may be of interest. The country visited consists everywhere of low hills with pine and fir woods up to five or six thousand feet, above which stretches open wettish moorland, good for Erebias; the only exception is in certain regions, usually of a dolomitic nature, where the moor is replaced by nearly bare rock with hardly any vegetation or water and consequently no Erebias. Such regions were the Dolomitic hills south of Lienz and the Weissenstein Kogel east of Obdach, forming the northern end of the Kor Alpe.

We visited the following places:—

1. Eisenkappel in the Karawanken Mts. about 15 miles S.E. of Klagenfurt at the junction of the Vellach and Ebriach streams at about 2000 ft. At the top, *i.e.* south, end of the Vellach valley is the Seeberg-passe, 3900 ft., over into Jugo-Slavia, which pass we also visited. Also on the N.W. is the Hoch Obir Mt. of which we visited the slopes up to 3800 ft. In Eisenkappel is a good inn, the "Niederdorfer Gasthaus." Dates July 7th-10th.

2. Obdach in Styria, 3000 ft. up, at the top of the pass north of Wolfsburg in the Lavanttal, over to Judenburg on the Mur. On the west is the Zirbitzkogel, 8000 ft., with hut on top. Dates July 11th-14th. At Obdach is an excellent inn, the "Gasthaus Grogger."

3. Lienz in Ost Tirol, 2900 ft., at the confluence of the Drau and Isel rivers. From there we visited all the hills around up to about 6000 ft. We also worked down the valley one day at about 2200 ft. In Lienz are many hotels. Dates July 19th-25th.

4. Heiligenblut in the Mölltal on the southern slopes of the Gross Glockner. Height 4200 ft. Here the snowline was at about 8000 ft. Dates July 27th-30th. Many hotels are to be found here.

The following species were taken:—

Erebia tyndarus, Esp.—At Lienz and Heiligenblut in most localities at 5-5500 ft. Always very local and in small patches. At Lienz in two spots were found trans. ad *dromus*.

E. manto, Esp.—In one small spot below the Gross Glockner at Heiligenblut at 5975 ft. was a small colony of trans. ad *pyrrhula*, all rather worn with a few females.

E. eriphile ssp. *tristis*, H.-S.—One on the Zirbitzkogel at 5800 ft. on the Kleines Winterleitersee along with *E. epiphron* and *E. arete*. It seems exactly like those I have taken at Prebichl further north (see Higgins, *Ent.*, Jan. 1929, p. 6).

E. pharte ssp. *fasciata*, Spul.—One from Heiligenblut in the same spot as *E. manto*. It is just like those from Prebichl, *vide supra*.

E. melampus, Fuess.—Common around Lienz and Heiligenblut on the wet moors at 4800-6500 ft. The lowest taken were in a clearing at 4350 ft.

E. arete, Fb.—Eight quite worn specimens were taken on July 13th around the Kleines Winterleitersee below the summit of the Zirbitzkogel at 5800 ft. This range is really the northern extension of the Sau Alpe which is a well known locality for this rare species.

E. euryale.—Two very different types were taken:—

1. At Obdach and Eisenkappel, the type seems to be *isarica*, Heyne (formerly *clanis*, Frhstr., see Warren, *Ent. Rec.*, Nov. 1931). On the upper side of both sexes, the brown bands have usually an irregular inside edge, few black spots (usually three and three), and without white centres; in some cases the black spots are practically absent. On the underside the forewings have the inner margin very indistinct and the brown spreads nearly to the body. In both wings the black spots usually have small white centres. In the ♂ the hindwings are unicolorous; in the ♀ they have a broad whitish or yellow sub-marginal band.

2. Around Lienz and on the Dobratsch Mt. near Villach in both sexes there is a tendency on the upper side for the brown band to split up, culminating in var. *ocellaris*, Stdgr., in which it survives merely as rings around the black dots; in a few cases even the rings have gone and also the white fringe. On the underside however in the forewing the band remains fairly wide and of regular breadth. The hindwings are as var. *isarica*. The *ocellaris* types formed at least half those seen.

E. ligea.—Common in most places up to the forest limit. At Eisenkappel it was newly hatched on July 7th, and in the plain near Lienz equally fresh on the 23rd.

E. gorge, Esp.—Mostly var. *erinnys*. At Heiligenblut in good condition on the Hochtor at 7000 ft. on July 29th.

E. epiphron, Kn.—On the Zirbitzkogel from just above the tree level at 4750 ft., up to 6500 ft., chiefly var. *cassiope*. At Heiligenblut on the Hochtor it went up to over 7000 ft. In the same district in the Fleisstal two specimens var. *nelamus* were taken on July 30th at 7000 ft.

E. lappona, Esp.—On the Zirbitzkogel from just below the summit, 8000 ft., down to about 6500 ft. where *E. epiphron* began. Some were quite battered, others quite fresh. At Heiligenblut on the Hochtor one var. *sthenno* was taken at 7000 ft.

E. ceto, Hb.—One specimen from above St. Johann im Walde near Lienz, at 6000 ft.

Heodes virgaureae.—Common at all places visited between 2000-5000 ft. Only males observed.

H. hippothoë.—Both sexes common, in a worn condition. A fresh male was taken at 6500 ft. at Heiligenblut on July 29th.

Rumicia phlaeas.—Single specimens taken at Obdach and Lienz.

H. dorilis.—A var. *montana* below the Seebergpasse. Typical form at Obdach.

Syntarucus telicanus.—Single specimens near Eisenkappel (1850 ft.) and near Lienz (2250 ft.).

Eveves argiades.—One worn female in the woods above Eisenkappel at about 3375 ft.

Plebeius aegon.—Common at all places visited, between 2000 and 6000 ft.

Polyommatus optilete.—Single fresh females at Obdach and Heiligenblut.

Scolitantides vicrama (haton).—A few fresh specimens at 2000 ft. on the plain below Lienz.

Plebeius orbitulus.—Common at about 6850 ft. and upwards near Heiligenblut, in very fair condition.

P. pheretes.—Same as *orbitulus*, with lower limit (a single specimen) at 5650 ft.

Aricia medon (astrarche).—Common.

Polyommatus eros.—Males common in good condition on grassy slopes above Heiligenblut, 5500-6500 ft.

P. icarus.—Common at most places and altitudes.

P. dorylas (hylas).—Common. Only males seen at first, the females not appearing before the last week in July.

P. coridon.—Common up to 5000 ft. at all places except Obdach.

Cupido lorquini.—Common at Eisenkappel around 2000-3000 ft.

C. minima.—Common at all places up to 5650 ft.

Lycaena alcon.—Both sexes in fresh condition in high meadow, 3800 ft. above Eisenkappel.

L. arion.—Common at all places up to 5000 ft. Var. *obscura* only taken at the lower altitudes (2400 ft.) near Eisenkappel and Lienz.

Lycaenopsis argiolus.—In fresh condition at Eisenkappel.

The following may also be of interest:—

On July 29th the Hochtor Pass above Heiligenblut N. over to Rauris was snowbound and there was a north wind coming over the pass. A constant stream of *Pieris brassicae* of both sexes kept drifting over the snow from the north, sometimes as many as ten a minute.

They flew at 20-30 feet up and passed down to the Mölltal where they settled.

On July 23rd we visited the Drau plain E. of Lienz, about 2200 ft. up. The usual type of *P. napi* was var. *napaee*, Esp. except in one quite small patch of wood where all were of a type very advanced to var. *bryoniae*, Ochš., in fact a small island of this variety amongst a sea of var. *napaee*.

Further Notes on a Willow Swamp in Windsor Forest.

By HORACE DONISTHORPE, F.Z.S., F.E.S., etc.

In January last I published a list of the Coleoptera taken in a willow swamp in Windsor Forest, totaling 162 species [*Ent. Rec.* **44** 4-6 (1932)]. In 1932 we have added 56 species bringing the total up to 218 for this one small area. Of these one is new to Britain again; one new to science, several of the *Athetæ* may also be new to science; and eleven species and one aberration are additions to the Windsor list.

Before giving a complete list of the additions for this year in this locality, a few remarks are necessary for some of them.

Acupalpus consputus, Duft.—Recorded from Windsor by Stephens in 1828, has not been retaken there until now.

Bembidium gilvipes, Strm.—Is generally found on the banks of rivers.

Helophorus strigifrons, Th.—Some 30 specimens of this very rare species have been taken, chiefly by sifting damp moss. The *H. laticollis* and *H. aeneipennis* of the former list have both proved to be this species. It is the *H. championi*, Sharp [*Ent. Mo. Mag.* **51** 236 (1915)], and *H. strigifrons*, Blackburn [*Ent. Mo. Mag.* **13** 40 (1876)]. I have compared the continental specimen labelled *H. strigifrons*, Th., in Champion's European collection (referred to by Dr. Sharp, l.c.) with the Windsor specimens and they are identical, as is also the specimen of *strigifrons* in Sharp's British Collection. As Sharp pointed out, "this seems to be excessively rare." He only took one or two specimens at Thornhill in 1868, Blackburn took it at Killarney (1876), Champion three or four (round about 1915) at Guildford, and recently Mr. Blair has taken a single specimen at Horsham.

Cercyon aquatilis, Donis.—Recently described by me [*Ent. Mo. Mag.* **68** 129 (1932)] from two specimens taken in a pot-hole in this swamp in April last. The next week the whole of the willow-swamp was covered with water to the depth of several feet, and although it has dried off since, no more specimens of this very distinct species have been taken.

Oxyptoda nigrocincta, Muls.—Two more specimens of this very rare and local "staph" were taken in damp moss.

Athetæ spp. ?—Three species of *Athetæ* appear to be new; a single specimen of one, over a dozen of a second superficially like *A. cambrica*, Woll., and ten specimens of a third very distinct little species.

Gyrophoena bihamata, Th.—A nice series in some small agarics growing under the moss.

G. convexicollis, Joy.—By beating old faggots and in moss.

Choragus sheppardi, Kirby.—A dead specimen was dug out of the root of one of the willows.

The following is a list of the additions in 1932. Those species new to the Windsor list are marked "N.W."

CARABIDÆ.—*Acupalpus consputus*, Duft.; *Pterostichus minor*, Gyll.; *P. strenuus*, Pz.; *P. diligens*, Stm.; *Anchomenus viduus*, Pz.; N.W. v. *moestus*, Duft.; *A. fuliginosus*, Pz.; *Bembidium obtusum*, Stm.; *B. guttula*, F.; N.W. *B. gilvipes*, Stm.; *Patrobus excavatus*, Th.

DYTISCIDÆ.—*Hydroporus pubescens*, Gyll.; *H. palustris*, L.; *H. planus*, F.; *Colymbetes fuscus*, L.; *Dytiscus marginalis*, L.

HYDROPHILIDAE.—*Anacaena limbata*, F.; *Helophorus affinis*, Marsh.; *Ochthebius pygmaeus*, F.; *Hydraena riparia*, Kug.; N.W. *Cercyon aquatilis*, Donis.; *C. lugubris*, Pk.

STAPHYLINIDAE.—*Oxyptoda umbrata*, Gyll.; *Drusilla canaliculata*, F.; *Atheta* sp. ?; *A.* sp. ? near *cambrica*, Woll., 12 specimens; *A. exilis*, Er.; *A. elongatula*, Gr.; *A. malleus*, Joy.; *A. melanocera*, Th.; *A. muscorum*, Bris.; *Falagria obscura*, Gr.; N.W. *Gyrophæna bihamata*, Th.; N.W. *G. convexicollis*, Joy.; N.W. *Oligota pusillima*, Gr.; N.W. *Myllaena minuta*, Gr.; *Mycetoporus splendidus*, Gr.; *Philonthus finetarius*, Gr.; N.W. *P. fumarius*, Gr.; N.W. *Gabrieus velox*, Shp.; *Xantholinus linearis*, Ol.; *Platystethus cornutus*, Gr.; *Oxytelus laqueatus*, Marsh.; *O. sculpturatus*, Gr.; *O. nitidulus*, Gr.; *O. complanatus*, Er.; *O. tetracarinatus*, Block; *Trogophloeus rivularis*, Mots.; *T. impressus*, Lac.

PSELAPHIDAE.—*Bryaxis foveolata*, Reich.

CRYPTOPHAGIDAE.—*Atomaria atricapilla*, Steph.

CHRYSOMELIDAE.—*Plectroscelis concinna*, Marsh.; *Psylliodes napi*, Koch.

ANTHRIBIDAE.—N.W. *Choragus sheppardi*, Kirb.

CURCULIONIDAE.—N.W. *Phyllobius urticae*, De G.; *Coeliodes 4-maculatus*, L.

I am indebted to my friend Mr. Keys for the names of the *Athetae*.

A Note on Lampides (Lycaena) boeticus, L.

By J. SNEYD TAYLOR, M.A., D.I.C., F.E.S.

During the first half of June, 1932, when the weather was mild, adults of *Lampides boeticus*, L., were observed flitting about over a plot of peas in a back garden in Pretoria, and, on a search being made, a number of eggs were found upon the buds and flowers. The adults were seen to feed at the nectaries of the flowers, and oviposition was observed. The egg is deposited upon the calyx of the bud, or flower, and, although as many as three eggs have been found upon a single flower, one is the more usual number.

A number of freshly deposited eggs were collected, and were kept in a room which was artificially heated during the day. Under these conditions the incubation period occupied from 15 to 16 days. The larvae on hatching, bored their way into the pea pods, and commenced feeding upon the contents. Only two individuals succeeded in reaching maturity, which they did after periods of 50 and 58 days. Pupation took place in the vicinity of the pods in which the larvae had been feeding, and the adults emerged 20 and 21 days later. Both larvae and pupae were maintained under the same conditions as the eggs. A larva found in the garden about the beginning of August, pupated on the 21st of the month, 8 to 10 days after the other two, mentioned above, had done so. The duration of the pupal period, in this case, was 16 days; the warmer weather prevailing during the time doubtless accounted for the difference in the number of days.

A few young larvae were found on the plants during June, and one larva, already mentioned, in August, but, although the plot was under observation throughout the winter, no other individuals were observed. It seems doubtful if any larvae can have reached

maturity out of doors in the plot concerned. This may be due to the fact that very few peas developed in any of the pods during the winter, many containing none at all. On September 1st an adult was observed in the garden, and a few others, apparently of recent emergence, have since been seen. No eggs have so far been found, however, although the plants are still flowering, and are at present bearing a crop of young pods. (5.x.32).

On October 23rd, while walking over one of the hills on the outskirts of Pretoria, numerous plants of *Vigna angustifolia*, Bth., were observed to be in flower, and adults of *L. boeticus* were seen in their vicinity. Several of the plants were examined, and on some, eggs of the *Lycaenid* were found.

It seems probable that, in the absence of cultivated host-plants, *L. boeticus* would be unable to breed during the winter on the High Veld, as there is no growth among its indigenous hosts during that season. Even when cultivated host-plants are present, it appears doubtful if many individuals can reach maturity under the climatic conditions obtaining at Pretoria, and elsewhere on the High Veld, during the winter months.

In the Low Veld of the Eastern Transvaal (Barberton District) the species is found in all stages upon peas during the winter. In the Cape (Brain, "Insects Pests and their Control in South Africa") it occurs upon *Virgilia capensis* and various species of *Crotalaria*. Eggs have been found upon the latter during ten months of the year at Stellenbosch.

LEPIDOPTERA AT MAURIN, BASSES-ALPES, FRANCE,

From mid June to September 8th, 1932.

Based on the Observations of A. E. BURRAS, F.E.S., W. PARKINSON CURTIS, F.E.S., and W. FASSNIDGE, M.A., F.E.S.

Carte d'état-major : LARCHE. Altitude : 1905-54 metres.

THE PARTY.—Mr. A. E. Burras (A.E.B.) of Portsmouth and Mrs. Burras, who formed the advance guard, arrived at Maurin in mid June and left on September 8th. Mr. W. Parkinson Curtis (W.P.C.) of Bournemouth was merely a bird of passage, being present only from July 28th until August 12th. Mr. W. Fassnidge (W.F.) of Southampton and Mrs. Fassnidge reached Maurin with W.P.C. and left with Mr. and Mrs. Burras.

GEOGRAPHICAL PARTICULARS.—Maurin is a small village near the head waters of the River Ubaye in the north-eastern corner of the Basses-Alpes. It is forty kilometres from Barcelonnette, which is also on the Ubaye. Alighting from the Paris-Briançon train at Prunières, Barcelonnette is reached by motor-coach, for the long promised railway is still in course of construction. There is no longer a courier that serves the valley of the Ubaye further than St.-Paul-sur-l'Ubaye, which is nine miles from Maurin and fourteen from Barcelonnette, so that the only method of reaching the village is by hired car. The route lies up the beautiful upper gorge of the Ubaye, right into the village, which is the limit for wheeled traffic. It is a good road of its class,

but is not recommended for nervous people, as there are numerous hairpin bends and in places it is decidedly on the adventurous side. Fortunately the type of Renault in general use seems stout-hearted, with brakes beyond criticism, and the driver was certainly careful and level-headed. The only thing to do is to remember that he is accustomed to drive along narrow ledges with a surface like a shingle beach, strewn with odd lumps of rock, and to hope that no one will come in the opposite direction, for possible passing places are few and far between. To add to the zest of the journey the bridges are very little wider than the car, and their parapets are not more than two feet high and rarely cemented. Maurin has a blockhouse occupied for ten days or so in the summer by a company of the Chasseurs Alpains, for it stands at the junction of the paths leading over three passes into Italy, the frontier being about three hours from the village.

PHYSICAL AND GEOLOGICAL.—Maurin lies amongst lofty mountains in a massif whose centre is stated to be Monte Viso in Piedmont. It is south-west of the Mont Blanc massif and due east of the Pelvoux massif, but quite distinct from either. These mountains seem to be part of the Ligurian Alps, the southern scarps of which are the Alpes-Maritimes. The rocks seem to be mainly Lower Jurassic; some appear to be Portlandian, Kimmeridgian and Liassic as at Digne. The curé of Maurin stated that they were entirely unfossiliferous; our observations coincided, so that actual age could only be fixed with certainty by a careful correlation which does not appear at present to be available. The overthrusting from the south which is so pronounced a feature at Digne is not here evident. The main upthrusts run from N.E. to S.W. with little evidence of secondary ridges. Igneous intrusions are in evidence at Maurin, not absent as at Digne, which is rather what would be expected since it is so much nearer to the igneous rocks of the Central Alps. The probable age of the intrusions would be Post Tertiary. The contortions at Maurin are exceedingly severe notwithstanding the apparent absence of overthrusting, and this is accounted for by the small distance between the summits of the anticlinal ridges. As the anticlines have as usual been entirely eroded, the line of the bottom of the valley is the line of the anticline and the mountainous sides are the synclinal troughs. It is easy therefore to imagine the steepness of the valley sides and the exceedingly jagged nature of the peaks, which are in fact the compressed and twisted springings of the denuded anticlinal arch. The proximity of the igneous rocks has metamorphosed the Jurassic shales and limestones into schists, schistose slates and similar rocks, and they are often highly crystalline, which accounts for the lack of identifiable fossils. The planes of cleavage enable the weather to break them into jagged scree of a most uncompromising character. The hardness of the rocks composing the scree enables it to maintain a high angle so that the slopes are frequently gradients in the very small single figures, and some precipices are reflex. The igneous rocks do not form the peaks but appear in the sides of the valley at 500 to 2,000 feet above its floor. They probably also appear in its floor, but as this is covered with detritus and littered with large masses of fallen rock, they cannot be traced there. They appear to be mainly a porphyritic granite (which is worked for road and building purposes at St.-Paul-sur-l'Ubaye), diorite and serpentine. The last named was formerly

worked at Maurin as green marble; it is very beautiful and takes a high polish. No true moraine formation was seen, and no evidence of glacial action; this must of course have been due to the friable character of the rocks. The peaks being the metamorphosed Jurassic rocks which have been turned through an angle of 90 degrees are fretted into the most fantastic forms, and would no doubt be exceedingly treacherous to climb. We did not try them as there was no point in wasting collecting time on bare and dangerous rocks, and an accident far from medical aid might have curtailed or completely stopped collecting. The peaks are mainly too steep to carry much snow, which slides off them and forms masses of *névé* in any suitable place at about 1,500 feet below the tops of the peaks. There are however several snowfields on the flatter tops and a number of glaciers and glacial lakes in the neighbourhood.

The river Ubaye is very fast and turbulent and even in summer dangerous. Its speed in the flatter parts of its course seemed to be six or seven miles an hour. In winter and spring it is so violent that the bridges of wood used during the summer are removed to safety. Although when we were there it was not carrying a big head of water, yet by reason of its speed a large volume passed down the valley, and it and its principal affluent were very difficult to cross even if one did not mind getting wet feet. Lake Prarouart is about two miles above the village and 3,000 feet higher. It is about three quarters of a mile long and about half a mile wide. It has evidently been a very beautiful lake but is now much choked with debris brought down by torrents and avalanches. The lake is fed by a stream from the Grand Rubren, by another from the Col de l'Auteret or Col Chabrière, and by a third from the Col Closis. The united waters of these three streams leave the lake as the Ubaye, and a large affluent joins the Ubaye just above the village. This affluent drains the Vallée de Mary and takes the snow water from the Maurin Sal and other mountains near the Col Marinnet or Col Mary. Below the village the valley widens a little and has meadows on each side of the river which are comparatively narrow; but about three miles below Maurin the valley suddenly narrows and becomes a rugged gorge.

Entomological research was mainly conducted between the head of the lake and this gorge and below the barren peaks on either side of the valley. The peaks, as to whose names and spelling the various authorities do not seem to agree, mainly exceed 10,000 feet. The highest is the grimly beautiful Point de la Font Sancté, the head of the mighty mass of rock which shuts in the valley to the westward. This peak is variously given as 11,400 feet, 11,900 feet, and 13,107 feet,* and it towers above Panestre or Panestral which is 11,000 feet. It is suggested that the lower figures refer to the tiny mountain paths or passes at the base of the final, inaccessible peak. The Roche de Ricoubout or Roburent stands conspicuously at the apparent head of the valley but is not as high as Font Sancté. The real head of the valley is Grand Rubren which is masked from the valley by L'Alpet. The floor of the valley drops 850 metres in seven kms. or an average fall of one in twenty. The valley is accordingly a long narrow ellipse

* W.P.C. has a gazetteer which gives this last figure and states that this mountain is the highest in that part of the French Alps, placing only the Pelvoux and one other peak higher. Visually it looks worthy of the distinction.

with its principal axis N.E. to S.W., forking at the top, with only one considerable side valley, and shut in by rock walls nowhere less than 8,000 feet above the floor.

CLIMATE.—The early part of June and July, 1932, was cold and wet. From July 24th onward the days were warm and sunny, but night temperatures were very low, and a wet afternoon in early August resulted in a fresh cover of snow from 9,000 feet up and a bitter night. On July 9th the lake had half an inch of ice on it as the result of a night frost. Nights were frequently in the neighbourhood of freezing and a day sun temperature of 110 degrees or upwards was often followed by a night temperature not exceeding 44 degrees. The sun dissipated the valley mists by 6 a.m. G.M.T. and by 8 o'clock was scorching. The temperature dropped with extreme rapidity after sundown. The afternoons were often cloudy, as after a hot morning the prevailing westerly winds struck the snowfields around Panestre and Font Sancté and the result was a long tail of cloud across the valley from 2,500 feet to 5,000 feet above the floor. The rapid formation and dissipation of the solid looking cumulus clouds and the extraordinary evolutions of the tails of smoky clouds from the peaks were a great source of interest and often of great spectacular beauty. Unfortunately, invariably as the clouds spoiled the late afternoon, with equal invariability they lifted at sunset and dissolved, leaving a clear cold sky for the night-work. Darkness supervened with rapidity directly the sun left the mountain tops and twilight was often so short as to be barely noticeable. The moon was as usual a nuisance and we all noticed the odd fact that although by reason of the height of the mountains and their steepness the moon only shone on the high slopes on the western side of the valley and for about 45 minutes directly into the valley as it crossed the gorge, so that the valley and its eastern slopes were in darkness, yet the flight of moths ceased when the moon rose even in those parts of the valley which were in shadow. Dews were heavy and were partly caused by the regular daily drop in temperature, partly by the cold down draughts at night from the snowfields and partly by the intense cold of the river, which began to condense a mist on the surface the moment the sun dipped. In the daytime the men wore an open necked shirt, flannel bags and a sun hat, but at night a full kit of clothes, plus overcoat, sweater and gloves, was barely enough to keep one really warm.

SOIL AND VEGETATION.—The soil is sparse and thin and full of rock, but rich, as it is decomposed Jurassic and Igneous rocks. It ranges from a soft, light, calcareous loam of which there is very little, imperceptibly up to shingle. It affords a fine example of how rock gardening should be done, being an almost complete negation of the average rock garden in England. Nature in this locality, wherever man has left her handiwork undevastated by that curse of the Alps, the destructive flocks of sheep, has achieved such results in rock gardening that the wildest and most extravagant language can give but a dim idea of the real beauty. As the season was a late one W.P.C. and W.F. were fortunate in reaching Maurin before the meadows had been cut, and it is quite safe to say that the beauty and variety of the flowering plants afforded to the party as a whole as much joy as the insects. Never a day passed without one of the party

finding some new speciality of interest and beauty, and we decorated our rooms and dinner table with bouquets stuck in any available jamjar. The idea of vases for floral decoration is apparently unknown at Maurin. On the western side of the valley and of course in the valley itself sheep are not permitted to work havoc, and the alpine flowers blazed in all their glory transcending description.

The mountain pine does not occur at Maurin where the only conifer is larch, which persists up to the snowline, but is slowly and surely disappearing under the demand for fuel. The season of growth is very short, and villagers experienced in woodcraft estimated the larger trees with a diameter of not much over two feet at 250 years. We counted rings on some stumps and were able to differentiate as many as 170. There are a few stunted ash trees in the village and others mixed with birch and willow at Le Barge. Aspen is common and a species of crack willow. Of shrubs another willow (?*Salix purpurea*), a berberis, a ribes which was not common, and an alder buckthorn were the only ones that attained any size. Wild roses, white, pink and deep crimson formed fair sized bushes and were a mass of beautiful and fragrant blossom. Of smaller shrubs, found chiefly above 7,000 feet, where no sheep had grazed, we saw *Daphne striata*, Tratt., *Rhododendron ferrugineum*, L., two procumbent sallows, *Arctostaphylos*, *Vaccinium*, *Helianthemum*, etc. Of herbaceous perennials and annuals there was such profusion that one hardly knows whether it is wise even to give genera. A striking yellow gentian was abundant, with the yellow Aconite (*Aconitum lycoctonum*, L.), and a pale yellow foxglove (*Digitalis ambigua*). There were two species of blue Aconite, one a very handsome plant, and edelweiss was found from river edge to snowline. There was a wealth of Gentiana, Silene, Lychnis, Dianthus, Atragene, Draba, Aizoon, Soldanella, Viola, Sedum, Saxifraga, Campanula, Cerastium, Sempervivum, Euphorbia, Primula, Anagallis, Pinguicula, Erigeron, Aquilegia, Dryas, Geranium, Anemone, Polygonum, Absinthium, Echium, Labiates and Legumes each adding its quota of colour and honey, and forming a multicolor background to magnificent spikes of Verbascum, huge thistles, Heracleum, dainty lilies and Asphodel. But where the sheep had grazed everything in the way of a plant was bitten to the root; the deadly sharp hooves had laid the roots themselves bare and loosened the soil so that it was washed down to add to the silt that blocks the delta of the Rhône. Behind the sheep flowers were conspicuous by their absence and lepidoptera numbered one or two to the acre. W.F. and W.P.C. went up L'Alpet nearly to the limit of vegetation where the sheep had passed first, and the only flowers were those in the rock crevices, while the morning did not produce thirty insects; even the alpine azalea was nearly reduced to bare poles. As the Encyclopaedia Britannica points out, the inordinate and illregulated grazing permitted by the French is rapidly ruining the alpine pastures, and the curé of Maurin informed us that within his own knowledge some rare plants had completely disappeared from the neighbourhood.

FAUNA OTHER THAN LEPIDOPTERA.—The wild quadrupeds noticed were the chamois, fox, hare, marmot, pine marten, black squirrel, another species of squirrel, and a shrew. The birds included the golden eagle, peregrine falcon, lesser kestrel, ptarmigan, redbacked shrike, redpoll, linnet, alpine pipit, alpine ringouzel, alpine accentor, black redstart,

alpine chough, goldfinch, buntings, several warblers, several species of tits, two wagtails and the sandpiper. It will be noted that quite a number of the birds are known insectivores. The wagtails were constant visitors to the wet weeps along the road where "blues" and "skippers" congregated to drink, and W.P.C. saw them take a number of butterflies and watched a hen black redstart that was feeding young in a nest in the wall of the inn come frequently to the nest with lepidopterous insects in her beak. W.P.C. also obtained a perfectly fresh *Parnassius apollo*, L. ♂ with the left hindwing completely shorn off, taken within a few yards of the nesting site of a shrike. There were a fair number of bees, a few dayflying beetles, and a wealth of Tabanids right up to the snowline. Very few mosquitoes were seen, a few Tipulids, large numbers of wasps the major part of which were diggers, and a superabundance of midges. The lamps did not attract the varied assortment of insects that one is accustomed to see in England.

THE VILLAGE COMMUNITY.—The village of Maurin, which is almost cut off from civilisation, consists of three small groups of houses, Le Barge at the bottom of the valley, Maurin proper in the centre, and Combe Bremond just above Maurin. This little community is one of the highest in Europe, and like so many of the French villages is dwindling with great rapidity. Since 1914 the population has fallen from 420 to 40. Maurin has a church, an inn plus telephone, and a blockhouse for the Chasseurs Alpins. It is the usual collection of small houses little better than hovels tucked under bluffs and built into rocks to secure some measure of protection from avalanches. The houses are stonebuilt and plastered with a very indifferent cement. The shingle roofs are nearly flat, and the eaves of great depth. A balcony is frequently added for storage purposes and not for ornament or pleasure. Drainage and sanitary conveniences are practically non-existent and baths are unknown. The houses have three storeys; the ground floor is a crypt-like structure housing cows, sheep, goats, fowls, etc.; on the first floor live human beings, while the second floor is a hay loft. Owing to the gradient one can usually enter any floor from the ground, and it is possible and often convenient to walk across your neighbour's roof in preference to climbing down round the house and climbing up again. We had a first floor over the cowsheds all to ourselves, save that immediately behind us was the cheese and sledge store. The woodwork was larch and carried a fine head of *Scolytus destructor*. Our various chemicals caused these much uneasiness and they drowned themselves in our hand basins in order to escape a life made miserable by creosote, naphthaline, etc. The beds were clean and comfortable, and bugs and fleas were absent. The rooms were kept as clean as the primitive conditions permitted. The only boots in the village that were ever cleaned were our own when we did them ourselves, and the only men who seemed to think it necessary to shave with any degree of frequency were the visitors. Well water was good and drinkable, but food was very limited in variety consisting mainly of home-produced mutton, salt pork and marmot. Good milk, butter and honey were abundant, and good coarse bread came up weekly from the nearest baker nine miles down the valley. Fresh fruit and vegetables were scarce almost to famine scarcity, for transport difficulties make anything but home grown supplies very scarce and dear. How long the inhabitants will resist the call of the towns and the long and dreary

winters is not easy to predict. This is of no benefit to the lepidopterist for the pastures are abandoned, hayfields are allowed to go wild, cultivation ceases, and the all destroying sheep follow, as devastating as a heath fire in southern England. One house in the village was exceptionally good; it was well cared-for without, its garden was trimly kept, and inside it had some very fine carved workwork. Many of the houses however were empty and ruinous. The life of the inhabitants is not enviable. In the six months' summer they must perform the entire cycle of agricultural routine which in more favoured places is spread over the year. Their methods are primitive, due partly to conservatism, partly to ignorance and poverty, and partly to the character of the terrain. They use the scythe and sickle, spade and hoe, sometimes a single shared plough with a single handle, and a very primitive type of spiked harrow. There is one horse and one cart in the village, and the rest of the transport is done by pack mule or donkey. In the winter, sledge, snowshoes and skis are in common use, while many women never go out of doors at all, for there is literally nothing to do outside. Besides, we saw where an avalanche had slipped down the flanks of L'Alpet into the lake, and the mountain side had been shorn of every tree and much of the herbage and soil as if it had been pared with a gigantic knife. In summer the men play bowls on the rough confined surface of the village square. There are occasional pilgrimages to chapels hidden away in the mountains, reached by devious and precipitous paths, and there is an annual fête day in honour of the patron saint. There are two tiny schools with four pupils each.

NOTES ON COLLECTING, etc.

NOTES IN 1932.—*EUROIS* (APLECTA) PRASINA, F. (HERBIDA, HB.) IN CORNWALL.—At various times between April 4th and April 20th, 1932, I found in all six larvae of *Eurois prasina*, F., feeding on primrose in woods near to Mawgan Park, N. Cornwall. Four perfect specimens hatched on May 30th, June 2nd, 4th, and 8th. Is this species widely distributed in Cornwall?

EPUNDA LICHENEA, HB.—Larvae of this species were not rare around Mawgan Park, N. Cornwall, between April 4th and 20th, 1932, feeding on the Thrift (*Armeria vulgaris*) growing upon the low walls peculiar to that part of the country. Strangely enough they seem to be almost confined to those walls running in a westerly and easterly direction, only one being found on a wall not in this position. Most of the larvae were found on a small piece of wall about 50 yards long, running to the edge of the cliff. They are easy to find with a lamp and are usually in colonies. I obtained a few larvae last year in the same place, and both lots fed up easily and well on unopened dandelion heads. I have been told this is dangerous, but I had no casualties. The imagines vary considerably between themselves, but all appear to be of the type coloration—olive green.

PLUSIA GAMMA, L.—I paid particular attention to this species in the garden this year (1932) and I noticed that early in the evening, before it was dark, the moth flew pretty generally all over it, showing preference to no special flowers, whereas when it was quite dark, they seemed to be almost confined to Valerian, with an odd one or two at

Delphinium or Catmint. From the middle of June to about the middle of July, specimens usually appeared about 9.30-9.45 p.m., and ceased flying (? for how long) at about 11 p.m.

MELITAEA AURINIA, Rott.—In 1931 I reared a considerable number of *Melitaea aurinia*, Rott., from larvae obtained from two strong colonies in Cornwall. They all turned out to be var. *scotica*, Robson, not one of them being the type, which is generally obtained in English localities.

The very few parasites there were turned out to be species of *Tachinidae* (Diptera). This year I again obtained a few more larvae from two different localities, both in N. Cornwall, and although only one emerged successfully, that one was also var. *scotica*. Is this the usual form of the species in Cornwall?—P. SIVITER SMITH.

CURRENT NOTES AND SHORT NOTICES.

We have got used, when Christmas comes, to expect further parts of Dr. Hering's *Minen-Herbarium*, the results of his study of the mines of all orders of insects during the past season. This season parts 10, 11, and 12 have arrived and are in no way less interesting and useful than the previous issues. There are 26 mines of Lepidoptera, 22 of Diptera, 7 of Coleoptera and 5 of Hymenoptera. We note that where it has been possible the larval case is also included; e.g. *Coleophora badiipennella*. Still we ask for more; in the case of some species which hibernate, the mine of the prewinter stage differs considerably from that of the final stages. The sheets are labelled plainly and the specimens mounted with the utmost care. In the 12 parts already issued the mines of no less than 240 species have been included. The Order is stated as well as the name of the food plant and its natural order. It is rarely that one finds a student of such high ability and acquirement who will do such work as the present. The study of insect mines is really a labour of love with him and the work is worthy of any help which may be given him, and we trust he will get adequate support for his venture. The subscription is now only RM 4 per part. Those who wish to obtain this valuable work should *not* write to the hitherto publishers but *send direct* to Prof. Dr. M. Hering, Berlin N.2, Invalidenstrasse 43, Germany.

We have received from our correspondent Rev. Canon G. Foster two separates of articles written by him for the Belfast Naturalist's Field Club and for the Belfast Natural History and Philosophical Society. The first, an annotated List of Lepidoptera of County Down compiled from his own observations of many years and records which have been published from Kane's work until now; a most useful pamphlet of over 30 pages, and made the more readily useful by an unusual feature for a List, an excellent index, but which, owing probably to the shifting of the type on the pages in the make-up of the reprint, is unfortunately not correct, e.g., 12 names at the foot of page 87 are indexed as on p. 88 and so on on p. 86. The second long article on "The Distribution of Insects in Ireland" deserves a much larger circulation than that of a provincial journal. The author has introduced a most fascinating subject by marshalling the many recorded facts in some instances confirmed by his own observations and records

but, as he says, has "not attempted any explanation." But he points out that "it is a subject that cannot be isolated; the lepidoptera and insects generally must be taken along with the flora; botany and geology may help in the long run to solve the problem." For instance *Platyptilia tesseradactyla* from Connemara only in the British Isles; *Dianthoecia capsophila* everywhere on the coast yet never in England; there *D. carpophaga* occurs commonly but never *capsophila*, while on the continent the former occurs on the uplands, the latter on the lowlands; *Nyssia zonaria*, on the Antrim sandhills, Co. Mayo, the Hebrides and Cheshire sandhills, while the rest of Britain, France and Holland do not possess this insect which is spread through the Alps, Northern and Eastern Europe to S. Russia; *Zygaena purpuralis* in S. Galway, one spot in Wales, and Oban in Scotland; and so forth, await study just as does the occurrence in Ireland of *Dryas octopetala*, *Sisyrinchium*, *Sibthorpia*, etc., among plants. Such problems await the future when the entomologist puts study before acquisition and tackles the real problems in earnest.

A meeting of the Entomological Club was held at the Museum, Tring Park, on Oct. 29th, 1932, Lord Rothschild in the Chair. *Members Present* in addition to the Chairman:—Mr. Robt. Adkin, Mr. Horace Donisthorpe, Prof. E. B. Poulton, Mr. H. Willoughby-Ellis, Mr. Jas. E. Collin, Mr. W. J. Kaye. *Visitors Present*:—Mr. H. E. Andrewes, Major E. E. Austen, Mr. E. C. Bedwell, Mr. K. G. Blair, Dr. E. A. Cockayne, Mr. C. L. Collenette, Dr. F. A. Dixey, Mr. H. M. Edelsten, Sir S. S. Flower, Mr. F. W. Frohawk, Mr. Philip A. Graves, Dr. G. D. Hale Carpenter, Capt. Francis Hemming, Mr. H. R. Hewer, Dr. Karl Jordan, Mr. W. H. Laing, Sir Guy A. K. Marshall, Rev. A. Miles Moss, Dr. S. A. Neave, Mr. Chas. Oldham, Mr. Louis B. Prout, Mr. W. B. Pyecraft, Mr. W. Rait-Smith, Capt. N. D. Riley, Mr. Hy. J. Turner, Mr. Edwin C. Van Dyke, Mr. Colbran J. Wainwright, Comm. J. J. Walker, Rev. Geo. Wheeler. The meeting was called for 11 o'clock in the morning, and the members and guests were received by Lord Rothschild at the Museum, where the entomological and other collections were open for inspection. Two special exhibits were also made by Lord Rothschild. These exhibits consisted of:—(1) The collection of British Micros placed on tables in the Bird Room, and (2) The collection of the Arctiids of the World contained in 220 drawers placed on view in the Insect Room. Both collections were arranged by Lord Rothschild himself. The Arctiid collection is of particular interest. It contains a large number of types and is especially rich in material from South America and New Guinea. The genera are arranged in the order adopted in Hampson's *Lepidoptera Phalaenae* and as in that classification neuration is paramount (mere convergencies in the development of the neuration being mistaken for evidence of relationship), the sequence of genera is frequently quite artificial. Therefore, until the family is thoroughly worked out, it has been deemed advisable for practical considerations to keep to Hampson's arrangement. In looking over the collection as exhibited, one is rather forcibly struck by the contrast in outward appearance between the Arctiids of the Old World and those of the Neo-tropic Region. The majority of the African and Indo-Australian species conform more or less closely to the familiar *Spilosoma* and *Diacrisia* type. In Central and South America, on the

other hand, the majority of species classified as Arctiids are more graceful in build, the forewing being narrow and the hindwing shortened and the colouring frequently strongly marked, many of them looking more like the Syntomids of the Neo-tropic Region than the European Arctiids. The caterpillars as far as is known are all of the rough woolly-bear type; they feed on low plants and some seek their food under water (*Rhyparia metelkana* in Hungary and *R. palustra* in South America for instance), their dense coat of bristles retaining enough air to enable the caterpillar to live under water for some time; specimens of these caterpillars are in the collection. The Arctiids, always a favourite group at Tring, are at the present time, November 1932, believed to be the most complete and best collection of this sub-family. It contains 648 types, of which 5 are Sir George Hampson's, 23 Felder's, 1 Guérin's and 619 Rothschild's, the latter being species and sub-species described by Lord Rothschild himself. A special feature of the collection is the large series of most of the species, for instance of *Spilosoma turbida*, Btlr., which is represented in the British Museum Collection by one specimen only, Butler's type, whilst there are in the Tring collection 41 males and 14 females. Of our cream-spot tiger, *Arctia villica*, and its local races the collection embodies 500 specimens in the general series exhibited, and over 100 more in Lord Rothschild's purely British Collection. In the South American species the large series were collected mostly by A. Miles Moss, R. Spitz, S. N. Cloges and the elder Le Moult. Also in the Indo-Australian section the bulk of the larger species were collected by A. S. Meek, W. Doherty, A. Erickborn and A. Everett. A number of Oriental species came from the Van de Pol Collection; the Algerian series were collected by Lord Rothschild and his staff, also by Dr. Chr. Nissen and Victor Farault (the latter under Lord Rothschild's direction); and the Moroccan series by Dr. E. Hartert and some helpers. Much interest was shown by the party in the exhibits which were fully explained by Lord Rothschild. Luncheon was served at 1 o'clock, after which Mr. Collin exhibited the following:—A specimen of *Leria* (*Spanoparea*) *dudai*, Czerny, a Dipterón new to the British list, taken at Tubney Wood near Oxford on October 2nd, 1932, during the week-end when the Club met at Oxford. The species was described in 1924 from a pair taken at Nimptsch in Silesia; the specimen exhibited being the only other recorded capture since the description was published. After luncheon the various collections in the Museum were again inspected, and after a most pleasant day the members and visitors left about 4 o'clock.—H.W.-E.

THE LATE MR. E. R. BANKES' MSS.—Mrs. E. R. Bankes has kindly handed over to me Mr. Eustace R. Bankes' manuscript notes relating to the work he had in progress at the time he was compelled to cease, and has also generously offered to bear the cost of publication. I have edited and published a few of the papers that were in a fairly advanced condition in the *Transactions of the Entomological Society of the South of England*, and I hope from time to time to be able to complete and publish in those Transactions more, but of course the less advanced a paper is the longer it takes to polish it for publication. I am however, nearing completion of one project that Mr. Bankes had very close to his heart, viz., a revised edition of Dale's *Lepidoptera of Dorset*; this work being notoriously inaccurate and out of date. No doubt

even after I have completed it there will be lacunae, but with a view of making it as full as possible, I should esteem it a favour if any Lepidopterist, who has collected in Dorset, will furnish me with as complete a list as possible of his captures, giving me precise locality and if possible the geological horizon on which the capture took place. This latter is a desideratum in a County like Dorset, where parishes are often on several widely separate geological formations.—W. PARKINSON CURTIS, F.E.S., 14, Alington Road, Bournemouth.

The Guides and Pamphlets issued by our British Museum (Nat. Hist.) have always attracted us, as a long row on a shelf in our library shows. They are well written, attractively written, well and attractively illustrated, concise and full of facts and useful information, never discursive and they are cheap. The pamphlet before us now, recently issued, *Clothes Moths and House Moths*, their Life-History, Habits and Control, by Major E. E. Austen and A. W. McKenny-Hughes, is no exception. It consists of 56 pp. and 20 figs., deals with six species from the economic point of view, and in such a way as to be not only useful, but attractive to the man in the street. An unusual feature for a pamphlet is an extraordinary complete index of four double-columned pages in small type. The species dealt with are *Trichophaga tapetzella*, L., *Tineola bisselliella*, Humm., *Tinea pellionella*, L., *T. pallescentella*, Staint., *Endrosis lactella*, Schiff, and *Borkhausenia pseudosprella*, Staint. As the spelling of these names differed from that in our current authorities who claim revision *up to date* we looked up the original (priority) author except Hummel and found those in the pamphlet correct. Meyrick puts *tapetiella* for *tapetzella*. Both Meyrick and Staudinger put *biselliella* for *bisselliella*. Staudinger puts *lacteella* for *lactella* (*fenestrella* of Stainton). We may well assume that the information in this pamphlet is as correct as the nomenclature, and we may congratulate the authors for their excellent work.

We should be pleased if readers would send us descriptions and particulars of any variation, which has not hitherto been noted, of the following Noctuid species, for consideration in our Supplementary Notes to Tutt's British Noctuae. *Mamestra albicollis*, *M. brassicae*, *M. persicariae*, *Pachetra leucophaea*, *Cerigo matura*, *Neuronia popularis*, *Neuria reticulata*, *Heliophobus hispida* and *Charaeca graminis* are shortly to be dealt with. Of the *Luperina* species which follow the above Mr. A. L. Rayward and Mr. A. J. Wightman are dealing with the *luteago* tangle and considerable material of the *testacea-nickerlii* complex is on hand sent by the late Charles Oberthür.

We were pleased to receive a few days ago a separate from Conte Emilio Turati. We had feared that he had ceased the valuable contributions to Italian entomology which he wrote a decade and more ago. He describes and figures a new form of *Parnassius delius* (*phoebus*) from the high valley of the Orio, Gran Piano di Noasca, which he names f. *paradisiacus*, with a secondary form of it *festai*. He figures the ♂ and ♀ of *paradisiacus*, ♂ and ♀ *styriacus* another high mountain race of *P. delius*, and also the *festai* form. "Parco Naz. del Gran Paradiso" Vol. III. 1932, Turin.

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EXCHANGES.

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Desiderata.—*Hyale*, *Welsh aurinia*, *Polychloros*, *Tiphon Agathina*, *Lunigera*, *Lucerneae*, *Neglecta*, *Diffinis*, *Populeti*, *Gothica v. gothicina*, *White Leporina*, *Tridens Putrescens*, *Littoralis*, *Typhae v. fraterna*, *Rurea v. Combusta*, *Gilvago*, *Fulvago v. flavescens*, *Liturata v. nigrofulvata*. *Harold B. Williams, Woodcote, 36, Manor Gate Road, Kingston Surrey.*

Duplicates.—A large number of species of European and Palaearctic *Rhopalocera* and *Heterocera*.

Desiderata.—All British species especially those illustrating characteristics of an island fauna. *Dr. Lor. Kolb, München 54, Dachauer-str. 409, Germany*, and *Franz Daniel, München, Bayer-str. 77, Germany.*

URGENT.—Wanted English (Cumberland) *Erebia epiphron*. Adequate exchange will be made in European Lepidoptera.—*B. C. S. Warren, 14, Avenue de l'Eglise Anglaise, Lausanne, Switzerland.*

I am seeking an opportunity of exchanging Macro- and Micro-Lepidoptera with English collectors and beg to send list of duplicates.—*J. Soffner, Trautenau (Bezirksbehörde), Bohemia, Tschechoslowakische Republik.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. January 18th, Annual Meeting, February 1st, 15th.

The South London Entomological and Natural History Society, *Hibernia Chambers*, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. January 26th, Annual Meeting, February 9th.—*Hon. Secretary, S. N. A. Jacobs, "Ditchling," Hayes Lane, Bromley, Kent.*

The London Natural History Society.—Meetings first four Tuesdays in the month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through Members, or from the Hon. Sec. *A. B. Hornblower, 91, Queen's Road, Buckhurst Hill, Essex.*

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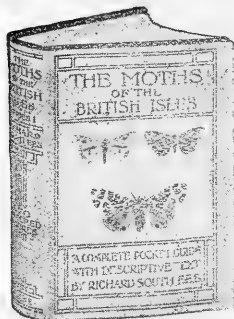
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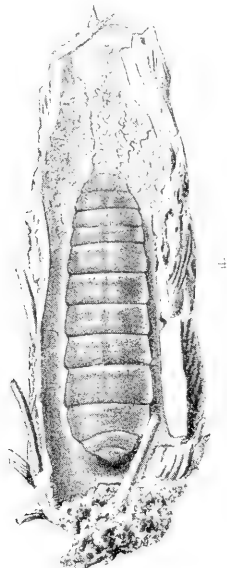
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Trans. Ent. Soc. Lond. 1900. Pl. VIII.



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ACANTHOPSYCHE OPACELLA, *H. Sch.*

With the permission of the Ent. Soc. of London.

Notes on the Psychidae. XIV. (With Plate I.)

By Rev. C. R. N. BURROWS, F.E.S.

In my last notes upon this subject, I dealt with the marked break in the continuity of species, which appears after the *Fumeidae*, and before *Epichnopterix*. There is actually another earlier break between *Fumea* and *Psychidea*, a break which severs the species following into two further sections. This is in the development of the female, and in the manner of pupation. The earlier species, with winged females, are able to distribute their ova in suitable situations and to cover them with their body silk. In the next section the wingless females are possessed of serviceable legs, and long (often very long) ovipositors, and are able to come out of the case, clinging upon the edge, to meet the male, after which they deposit the ova within the empty pupal shell. They do not, in fact cannot, re-enter the case, therefore fall off, and perish.

THIS OVIPOSITING INTO THE PUPAL CASE IS THE RULE THROUGHOUT THE REMAINDER OF THE PSYCHIDES.

After *Fumea*, the degeneration of the females is rapid, and complete. Only rarely do we meet with even an apology for legs, antennae, or eye-spots. *Psychidea*, is described by Seitz as "entirely reduced." *Canephora* would appear to be the best developed, with vestiges of eyes, antennae, and legs. *Pachythelia*, *Acanthopsyche*, *Amicta*, and *Hyalina*, are more reduced than *Canephora*. Unfortunately, with my limited, and dry, material, I am scarcely in a position to verify these particulars, but so far as specimens are available, they do not seem to be far wrong. The head parts of these females (after *Fumea*), are all confused and hardly recognisable, being generally bent over, and downwards. The anal parts are somewhat dilated, and usually bear vestiges of the ovipositor rods, while the ovipositor itself is reduced to the smallest proportions. In these species indeed there is no necessity for a directional ovipositor, for the ova can only be projected into the pupal shell.

In both Tutt, and Seitz, one reads about some of these helpless females "leaving the case." This appears to me to be a somewhat ambiguous expression. I do not understand how they can do this unless by ovipositing themselves out of house and home. Their structure appears to be generally of the flimsiest, and they can scarcely possess strength, or volition, to wriggle out. There is just one thing they must do, which is, open their shell, to afford access to the male. This he could not do for himself. There are two suggestive facts, which may perhaps explain how this becomes possible. First of all most, if not all, of these females, have upon the dorsal surface of the thorax, a series of stiff plates, so stiff as to make it difficult to prepare a symmetrical mount. Maybe these confer upon the insect a certain amount of "hold" or "grip" from which sufficient leverage is obtainable to open a way. Further than this Chapman, and others, have stated that the female as she gets rid of her ova replaces them in the vacated space by inflating her body with air. I have, in fact, mounts which show very large tracheae. It may be that both these agencies combine to give the imprisoned insect the necessary power to open the way. As however we are generally able to find the female within the

pupa shell, it does not appear correct to assert that this sex habitually "leave the case."

Undoubtedly there are circumstances under which they do come out. This would appear to be when no male has arrived, and the movement may represent a second "calling." This I have seen for myself, and have mentioned already (*Entom. Rec.* XXXVII. 1925, p. 18). How then are these unfortunate creatures ever to find mates, imprisoned as they are in a fixed position, with the head towards the entrance of the case? This would appear to make copulation impossible. The difficulty is however met by a great development in the structure of the male. He is now endowed with a greatly extensile abdomen, which enables him to reach down, past the female body, to the far end of the pupal shell, which is, of course, closed. This is certainly the explanation of the enormous powers of extension, found in the later species of the Psychides.

So far as the males are concerned, so far as I know, all these late species behave in much the same manner at pupation. The time for this change having arrived, the case is first lengthened by a long narrow silken tube.*

Along this tube the pupa pushes its way, and as it advances the tube tightens, until it so grips the pupa that it can get no further. It is now projecting a certain distance, and emerging, leaves the pupal shell visible, and tightly held. Collectors are thus able at a glance to detect the empty male cases.

It is not so with the females, which so far as I know spin no tube, but leave only a hole.

The accompanying plate (copied by permission from the *Trans. Entom. Soc. Lond.*, 1900, Plt. VIII.) illustrates this. The figures drawn by Dr. Chapman, represent *Acanthopsyche atra*, L. (*opacella*, H.S.), which belongs to the later section of the larger Psychides, and is of the greater interest as being one of the three large species found in Britain, though rarely. The actual specimens, I deposited in the British Museum, as soon as I found them in Dr. Chapman's collection.

These remaining species from the beginning of *Epichnopteryx* to the end of our list fall into sections, while they are united in having helpless females. I have at present little to say about the genera intervening, *Epichnopteryx*, *Stichobasis* (of which I know nothing) and *Apteron*. I can only state with certainty that the pupae and pupation of the two which I do know are quite normal, with the pupal shell thin and cylindrical. From *Arctus* onwards there is a noticeable division in the pupation of the females. I divide these into two sections.

SECTION A.—In the genera *Pryche*, *Arctus*, and *Sterrhopteryx*, at least, (I cannot be more precise, as I lack material) the pupa (or puparium) is markedly different from the rest of the group, and indeed from Lepidoptera in general. This is now hard, segmented, but rugose, and shrivelled, with lighter red or yellow ends. The ends being much thinner than the main body, and very brittle. One, or

* This tube varies amongst species. In *Amicta quadrangularis* it is not constructed, nor is it in the species (probably an *Amicta*) which I had from Dr. Buxton, the development of which I have previously described. (*Entom. Rec.* XXXVI. p. 97) in neither of which is there a tube, so that I was able to see the dead pupa in the mouth of the case. Nor does it appear in Dr. Chapman's species *Pyropsyche moncaunella*.

both, are usually broken, but the anal end is, or should be, intact. It will be noted that in copulation the male abdomen enters the pupal shell at the head. These hard pupal shells when macerated in caustic potash lose their rugosity, and may be flattened out. There does not appear to be any indication of free movement of the segments, and there is no thinning between them except towards the head parts, which do appear to be in a measure free. Indeed there may be some movements of segments, as in several of Mr. Pierce's mounts there appears to be a distinct circular plate which is nearly free. In these pupae the spiracular scars are plainly marked, and the anal end completely rounded, and closed, when the shell is intact.

The thickness and extreme stoutness of these pupae, mark them off from the rest of the Psychides.

The females in this section seem to be of extreme delicacy, scarcely more than thin skin. They are attenuated towards the head, with horny plates upon the dorsal portion of the forward segments. I have already alluded to these plates and their probable use. The ovipositor here is reduced to a mere button, but usually exhibits the vestiges of the ovipositor rods.

The intrusion of these strangely modified pupal arrangements comes as a surprise. I am following Tutt's list, as the only available one. There is not much to be learned about them in my reach. Tutt (*l.c.* 428) quotes a description by Chapman, which is not very clear. Seitz mentions them several times. They do away with my assertion that the pupa-shell of the male would provide a guide to that of the female.

It will be noticed that I am using somewhat new terms for describing here. The term "case," doubtfully restricted to the larval case, produces confusion when applied to the cover of the pupa. Therefore I am using the term "shell" for the covering for the pupa, and "skin" for that of the female.

I am not convinced as to the point of division between this section and the next. What follows *Sterrhopteryx* is not clear to me, as I have no material. I do not think the dark, red-ended pupa extends further in the list. *Standfussia* has certainly only a thin pale pupa shell. I have not secured female pupae, nor isolated any females, until *Oreopsyche kahri*, which also has a thin, pale, shell.

SEC. B.—According to Tutt this section should commence with the *Acanthopsychina*. I have only come across *Acanthopsyche atra* and *Pachythelia villosella*. The plate shows the thin cylindrical shell of the former. *P. villosella* is, I believe, much the same, but I have at present no decent mount of that species. I have however a specimen, which I propose to figure with my next notes which shows that this species has a thin cylindrical pupal shell, and not the red ends of section A.

While endeavouring to complete this portion I have received from Dr. F. M. Jones of Wilmington, Delaware, a very extensive series of female larval cases, collected by himself. And I am very curious to learn whether my Section A, parallel with *Psyche*, *Arctus*, and *Sterrhopteryx* occur in the Neo-Arctic fauna.

EXPLANATION OF PLATE. I.

- Fig. 1. Disposition of the male in pairing.
 „ 2. Female latero-dorsal view.
 „ 3. Female sac opened during pairing, from a specimen in glycerine. The glycerine has caused some shrinkage of the female.
 „ 4. Attempt to show the cremastral-cocoon silk in female sac with passage through this, for entry of the male abdomen.

The figures 1-4 are amplified about 4 diameters.

On Recording Entomological Publications.

By HORACE DONISTHORPE, F.Z.S., F.E.S., etc.

Dr. Walther Horn has sent me a pamphlet in connection with Entomological Bibliography; at the end of the paper is a request to the Entomologists of the world, which I propose to reproduce here:—

“Request addressed to all entomologists of the world to help the “Deutsche Entomologische Institut” to build up a bibliographical card index for international references.

The card index has to contain all titles which have been published in all branches of entomology in the world since 1864.

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2. The attention of all younger entomologists is drawn to the fact that it would be very useful consecutively to number their entomological publications.”

Personally I have always numbered my entomological publications consecutively, following the example of the late Charles Janet, Eric Wasmann, etc. I have recently circulated a list of my publications for 1930 and 1931:—1) Coleoptera and General Entomology: Nos. 265-297; and 2) Myrmecology Nos. 146-155.

In the *Entomologists Record* 37 125-161 (1925) will be found a list of 1) Nos. 1-235; and 2) in the 2nd edition of British Ants Bibliography pp. 412-16 (1927) Nos. 1-132.

I now propose to publish 1) Nos. 236-264; and 2) Nos. 133-145, when all my publications to the end of 1931 can be traced. In future I propose to publish a list of each year's publications at the beginning of the following year.

1. COLEOPTERA AND GENERAL ENTOMOLOGY.

No. 236. “Two Species of *Staphylinidae* (Coleoptera) New to Britain.” *Ent. Rec.* 37 166 (1925).

No. 237. “A Day's work in the Life of a Wasp.” *Ent. Rec.* 38 12-13 (1926).

No. 238. “A Day's Collecting in Hainault Forest.” *Ent. Mo. Mag.* 62 39 (1926).

No. 239. *Euplectus afer*, Reitter var. *infirmus*, Raffray. *Ent. Mo. Mag.* 62 49 (1926).

- No. 240. *Rhizophagus bipustulatus*, F. ab. *gyllenhali*, Th. *Ent. Mo. Mag.* **62** 59 (1926).
- No. 241. "*Geotrupes spiniger*, Marsh, at large in December." *Ent. Mo. Mag.* **62** 59 (1926).
- No. 242. "*Aphodius rufipes*, L., at light." *Ent. Mo. Mag.* **62** 59 (1926).
- No. 243. "Marriage? flight of ♂♂ of *Pseudococcus gahani*, Green." *Ent. Mo. Mag.* **62** 59-60 (1926).
- No. 244. "A few notes on some Windsor Beetles." *Ent. Mo. Mag.* **62** 263 (1926).
- No. 245. "British Bark Beetles" by Dr. J. Munro. Review. *Ent. Rec.* **39** 61-64 (1927).
- No. 246. "*Cryptophagus lövendali*, Gauglb., a dweller in *Vespa* nests in trees." *Ent. Mo. Mag.* **63** 111 (1927).
- No. 247. "The Bionomics of *Ludius ferrugineus*, L." *Proc. Ent. Soc. Lond.* **2** 39 (1927).
- No. 248. "The Copulation of *Scaptia fuscata*, Müll., and a case of abnormal copulation in two species of *Staphylinidae* of different Genera." *Ent. Rec.* **40** 12 (1928).
- No. 249. "Homoptera devoured by a bird." *Ent. Rec.* **40** 27 (1928).
- No. 250. "*Gnorimus variabilis* in Windsor Forest." *Ent. Rec.* **40** 28 (1928).
- No. 251. "Three Species of Coleoptera new to Britain." *Ent. Rec.* **40** 39-41 (1928).
- No. 252. "Some Aberrations of Coleoptera not previously recorded for Britain." *Ent. Rec.* **40** 55 (1928).
- No. 253. "*Quedius infuscatus*, Er., a species of Coleoptera new to Britain." *Ent. Rec.* **40** 85 (1928).
- No. 254. "The Bionomics of *Pocota apiformis*, Schrank." *Entom.* **61** 150-151 (1928).
- No. 255. "*Dorcatoma serra*, Panz., a species of Coleoptera new to the British List." *Ent. Mo. Mag.* **64** 179 (1928).
- No. 256. "*Dorcatoma dresdensis*, Hbst., and *D. serra*, Pz., two new British Insects." *Ent. Mo. Mag.* **64** 196-199 (1928).
- No. 257. "*Anaspis florenceae* nov. sp., a species of Coleoptera new to Science, with a few notes on some other species of the genus." *Ent. Rec.* **40** 121-22 (1928).
- No. 258. "*Hydrothassa marginella*, L. ab. *devillei*, Bullock." *Ent. Mo. Mag.* **63** 207 (1928).
- No. 259. "Dragon-flies." *Ent. Rec.* **40** 173 (1928).
- No. 260. "*Atomaria morio*, Koleneti, a species of Coleoptera new to Britain." *Ent. Mo. Mag.* **64** 30 (1929).
- No. 261. "*Histeromerus mystacinus*, Wésmael, a Coleopterous Parasite." *Ent. Rec.* **41** 125 (1928).
- No. 262. "*Gymnetron lloydi*, n.sp., a species of Coleoptera new to Science." *Ent. Rec.* **41** 125 (1928).
- No. 263. "*Longitarsus nasturtii*, F. var. *obscura*, n.var., a variety of *Halticinae* (Coleoptera) new to Science." *Ent. Rec.* **41** 126 (1929).
- No. 264. "*Agathidium reitteri*, Ganglb. A species of Coleoptera new to the British Isles." *Ent. Mo. Mag.* **65** 82 (1929).

2. MYRMECOLOGY:—

No. 133. "British Ants Their Life History and Classification." Second Edition, Revised and Enlarged. 18 plates, 93 Diagrams. George Routledge and Sons, London, 1927.

No. 134. "Gynandromorphism in Ants." *Proc. Ent. Soc. London* 1 92-93 (1927).

No. 135. "The Guests of British Ants. Their Habits and Life Histories," I.-XXII.+244, 16 Plates and 55 Text Figures. George Routledge and Sons, Lond. (1927).

No. 136. "The *Formicidae* of Lancashire and Cheshire." Lancs. and Chesh. Thirteenth Annual Report and Report of Recorders for 1926, p. 4 (1927).

No. 137. "Folia Myrmecologia et Termitologica," Review. *Ent. Rec.* 39 79 (1927).

No. 138. "On Silk Spinning in the *Formicidae*." *Proc. Ent. Soc. Lond.* (1927) 93.

No. 139. "The Social World of Ants." Forel. C. K. Ogden's translation, Review. *Ent. Record* 40 64 (1928).

No. 140. "Ants as Social Insects." *Science Progress*, No. 91. January, 1929. pp. 506-513.

No. 141. "Ants, Bees and Wasps" (Lubbock). New Edition by J. G. Myers (1929). Review. *Natural History Magazine* 3 No. 11, 107-109 (1929).

No. 142. "Gynandromorphism in Ants." *Zool., Anz.*, 92-96 (1929).

No. 143. The *Formicidae* (Hymenoptera) taken by Major R. W. G. Hingston, M.C., I.M.S. (ret.), on the Mount Everest Expedition, 1924." *Ann. Mag. Nat. Hist. (S. 10)* 4 444-449 (1929).

No. 144. "Notes on the Genus *Paxyllomma* (Hym. Brac.), with the Description of a New Species taken in Britain." Read December 4th, 1929. *Ent. Soc. Lond. Trans. Ent. Soc.* 78 87-93 (1930). Plate VIII. figs. 1-3.

No. 145. "Ameisenkunde Eine Einführunge in die Systematik und Biologie der Ameisen" von Dr. Anton Krausse. Stuttgart, 1929. Review. *Ent. Record* 42 63-4 (1930).

Notes on Erebiid Species.

By B. C. S. WARREN, F.E.S.

(1) *E. pluto*, de Prun.—In the *Entomologist's Record* of 1929 (page 146) I published the name *glaciale* pro *glacialis*, Esp. In this my object was to keep the name of this well-known insect as like that under which it had been known, as possible; Esper's name having to fall. I am informed, however, that names only differing in gender are regarded as identical. It is therefore necessary to adopt another name. Following the excellent suggestion of Dr. Jordan, to name this insect which frequents the alpine heights to the very margins of the snowline, after the mountain nymph, I substitute the name **oreas** nov. pro *glacialis*, Esp.

(2) *E. aethiopellus*, Hoffmigg.—Mr. L. G. Higgins, in his instructive paper on the butterflies of the Piedmont (*Entmol.* 1930) pointed out that there are two distinct races of this species: one, the northern,

which he correctly placed as typical *aethiopellus*, and a southern, which he referred to *gorgophone*, Bell. The principal difference between these races lies on the underside; this in *aethiopellus* has a speckled appearance due to a thick sprinkling of whitish scales over the dark ground colour of the hindwings and the borders of the fore. The southern race is practically without this super-scaling, and appears much darker, the hindwings of the ♂ being a clear brown colour. The ♀s show the same characteristic, though not so distinctly.

Unfortunately, the assumption that Bellier's *gorgophone* from Barcelonette were the southern race, was wrong; specimens from Larche and as far south as Allos belonging to the northern type. As I had not actually seen any specimens from Barcelonette I have not referred to the question before. Some time ago, however, I found in the Oberthür collection, in the British Museum, 3 ♂ and 3 ♀ specimens of *gorgophone*, which Oberthür got with the Bellier collection. These were labelled "Larche," presumably by Bellier. Though these specimens cannot be taken as "types," they prove that Bellier captured the insect he called *gorgophone* at Larche, and of course these six specimens *may* have been some of his original examples. Like other specimens from Larche they were of the northern type, and there were no Barcelonette specimens of Bellier's. *Gorgophone* therefore belongs to the northern race and the name falls as a synonym of *aethiopellus*.

As already mentioned, the northern race extends as far south as Allos, and for all I know still further. The southern one, which as it happens is much the best known among English collectors, seems restricted to the south-east corner of the Maritime Alps; from St. Martin Vésubie, the Tenda and Limone districts. I am therefore adopting the name, ssp. ***mediterranea*** nov. for this race.

(3) *E. dabanensis*, ab. ***lanceolata*** nov.—I take this opportunity of describing this aberration, which even in this species so given to individual variation is an exceptionally striking specimen. The dark median band on the underside of the hindwings, which is always a feature of the species, normally has a very irregular outer edge, which forms a series of more or less rounded projections into the pale antemarginal band, between the nervures. In this specimen these projections are considerably deeper than usual, and distinctly lancet-shaped, terminating in a series of seven sharp points, some of which extend half-way across the antemarginal band, which is a pale bluish-grey in colour. The black spots normally situated in this antemarginal band are wanting. The effect is so striking that the specimen deserves a name, although the chance of a second specimen ever being found is certainly very slight.

Holiday Notes: Eastbourne District. 1932.

By J. A. DOWNES and B. J. MACNULTY.

Last year we spent our summer holidays, from August 2nd to the 27th, in the Eastbourne District, and except for two days, collected in the area covered by Mr. R. Adkin's book *The Moths of Eastbourne*.

During that time we discovered three species apparently new to the district—*Nudaria mundana*, *Acronicta auricoma* and *Hydroecia paludis*. *H. paludis* (2) were taken at sugar about August 20th; and *A. auricoma*

was also at sugar on a telegraph post near Eastbourne and well away from any woods.

The first evening was spent exploring the lanes around Alfriston and netting any moths we came across. *Nudaria mundana* was taken quite freely by this method. Other species found were *Epione repandaria* (*apiciaria*) (1), *Lithosia griseola* (many examined but all absolutely typical) and *L. lurideola* (rare).

On August 16th we found dozens of *Eremobia ochroleuca* by day on the black knapweed heads, whereas before and after that day only 2 or 3 per day were found. Most were found between 12 noon and 1 p.m., although a fair number were still to be seen during the afternoon. The morning had been dull and slightly rainy, but it was brighter while they were about. Most of the moths were flying from plant to plant and feeding, which we did not often see them do on other days. None were found on the greater knapweed, but several were observed on scabious.

On the evening of August 15th we went early to Abbott's Wood for sugaring, taking with us a small breeding cage, with a view to assembling *Psilura monacha*. On arriving at the spot, where we had previously discovered this species, we conducted a thorough search but only discovered one specimen, a female, obviously freshly emerged. We had expected to find more, as on previous days they were rather more in evidence. We set the female up in the cage and set to work sugaring the trees. Returning to the cage at about 11 p.m. we found a worn male fluttering around. They paired immediately and the female laid 200 to 300 eggs, which were placed deep down in minute cracks in oak bark in batches of from 40 to 70.

Later on we became interested in the *Dianthoecias* and collected many ova and larvae of this genus.

Dianthoecia cucubali was found as ova and larvae in the inland localities on *Silene inflata*. It was extraordinarily abundant in both stages. The ova are usually laid on or near an undeveloped flower bud into which the larva burrows on emergence. The older larvae are found in the pods that contain mature seeds. Its near ally *D. capsincola* has different habits. Not enough eggs were found to say definitely where they are usually laid, but those that we did get were on petals or pods of *Lychnis dioica*. The young larvae burrow into a pod which has already set seed, but in which the seeds are in the white immature condition. Later on they seemed to prefer the mature brown seeds.

The ova of the two species are very easy to distinguish when found, apart from their occurring on different plants. The ovum of *capsincola* is conspicuously larger than that of *cucubali*. (Mr. Tonge gives the following measurements—*capsincola* .9mm., *cucubali* .65mm.). *D. cucubali* was found on *Silene inflata* and on *S. maritima* on the Crumbles, where Mr. Sharp says this moth does not often occur. *D. capsincola* was always found on *Lychnis dioica*. *D. carpophaga* was also found on the Crumbles on *Silene maritima*, ova and larvae both being fairly common.

Towards the end of the holiday we collected larvae on the banks of the Cuckmere river above Alfriston. The first kind found was a Noctuid, almost certainly *Apamea unanimitis*. These were feeding on the sedge growing in the stream. They roll over the edges of the sedge

leaf and fasten them together with silk, thus making a long tube in which they remain by day. This is not a permanent shelter and is easily constructed. The larvae soon eat the leaf of which the tube is formed and then construct another. On one occasion a well-grown larva was found on a solitary sedge stem growing in the water, and well away from any solid support. As the leaves on that stem were hardly eaten at all it was obvious that the larva must either have swum there or been put there artificially. So we later experimented with the larvae by putting them in still water in which stood an upright sedge stem, and found that under favourable conditions the larvae could climb up from the water on to the stem and that they could remain afloat without injury for a considerable time.

Plusia festucae was another insect found among the sedges. On August 20th four cocoons were found. They were formed along the underside of a sedge leaf which was bent both transversely and longitudinally so as to form a very good shelter for the pupa. Hence the white cocoon could be seen only by getting underneath it, and as they occur only one foot or so above the water-line collecting was difficult. The methods adopted were:—1. Going for a bathe in the river and so getting underneath them. 2. Going out in a canoe and watching for the characteristic bend of a sedge leaf. These *P. festucae* were, of course, of the second brood. Two of the four just referred to emerged on August 24th. On the 27th a number of cocoons with pupae in were collected, also two empty cocoons and one full fed larva. All had emerged by September 14th.

Triphaena pronuba proved to be exceptionally variable in this district, and although we took forty specimens we regretted not having taken more.

We might finish this note by some remarks on *Lasiocampa quercus*. Several males were seen on the Downs about August 6th, but although we exposed freshly bred females on several occasions only one was assembled. Later a larva in the first instar was found in a wood near Lewes.

NOTES ON COLLECTING, etc.

VANESSA IO, L., AND SWALLOWS.—On April 18th, 1932, during a holiday in North Cornwall, I paid a short visit to Porthcothan, which is the next Porth above Mawgan Porth, to collect *Pararge aegeria*, L., var. *egeydes*, Stgr. Specimens of this species from Cornwall have a more fulvous tone about them than those found in other parts, more nearly approaching the type form, and having caught several nice ones there before I was anxious to obtain more. There was only one however.

The most interesting thing I saw was in connection with *Vanessa io*, L. On the north side of the Porth—a fairly steep hillside covered with heather, brambles, etc.—there were a number of hibernated specimens of *Vanessa io* flying about and settling. There were also many swallows flying rather low over the ground. On at least four occasions I saw a *Vanessa io*, which was sunning itself on the ground, dash up in the air and follow for a short distance a swallow which flew close to it.

The way in which several species (notably *Rumicia* (*Heodes*) *phlaeas*) will dash after other butterflies is well known, and I can only suppose that these *Vanessa io* mistook the swallows for specimens of their own species. This observation may be of interest, in view of the fact that butterflies have been observed migrating with birds. Might not the butterflies have been deceived momentarily and have taken the birds for other butterflies? If several butterflies did this it might easily be the start of a migration, brought about almost, one might say, by "imitation." It is at least a possibility which might be worth considering.—P. SIVITER SMITH. Pebworth, nr. Stratford-on-Avon.

HIbernating INSECTS.—On several occasions I have made a search in our buildings, lofts, etc., to see if I could find anything of interest in the way of hibernating insects, but the results have been rather disappointing. However, they may be of interest to one or two people so I put them on record. Unless enclosed in square brackets, the remarks are quoted from my diary.

November 23rd, 1930.—Went to "Little Meadow" [an empty house] to look for hibernating moths, etc. Found six Queen Wasps—four of them in one corner of a window facing south. Wings held under abdomen, front two legs not used; head tucked under as much as possible.

January 7th, 1931.—Went searching for hibernating insects again—found a *Cidaria miata*, L., in the kitchen, and another with a *Scoliopteryx libatrix*, L., in a loft. Also a beautiful *Polygonia c-album*, L., in a pig-sty. It had a variegated underside, not plain. I read that spring specimens (*i.e.*, hibernated August ones) have plain undersides; this definitely had not. [Resting in an inverted position on a beam.]

I also found [in Little Meadow House] four hibernating queen wasps (we looked on November 23rd and there were six wasps there)—they were hanging on by their six legs and their mandibles were nowhere near the wood (one was on the door and three on the window). [It will be noticed that they had altered their resting positions; I imagine the two had moved off to somewhere else or died.]

December 6th, 1931.—Four *Cidaria miata*, L., in the loft.

February 22nd, 1932.—Went into the hay-loft where, on December 6th, 1931, there were four *C. miata*, L., hibernating and found three; they were in good condition. Two of them were resting on wooden beams and one on the tiled roof; the other four (6.xii.31.) were all on wood. [Again they have shifted their positions.]

December 24th, 1932.—Made another search in the buildings. There were no insects hibernating in Little Meadow House at all. This is strange as it is an ideal place. In a meal house, which adjoins the loft, there were two fine *Vanessa urticae*, L., resting in an inverted position on the wooden ceiling.

There was an unusually large collection of insects in the loft, which is the usual hay-loft with a tiled roof and wooden beams—it is used very little now.

Vanessa urticae, L.—Two fine specimens, resting inverted on wooden beams. I imagine this species hibernated early this year, as there were few about in the autumn (although more than there were in the summer) and all four specimens found were in excellent condition.

Scoliopteryx libatrix, L.—Seven fine specimens, and the wings of another in a cob-web. Five of these were resting on wood, one was half on a tile, and one was wholly on a tile. They were all inverted.

Cidaria miata, L.—Five fine specimens, all on tiles, three of them very close together. All inverted, two high up. There was one Queen Wasp, resting inverted on a tile, but it was too high to examine closely.

I remember finding a green Lace-wing in the loft on one occasion, but I can find no entry for it.—Id.

EUPITHECIA PUSILLATA IN NORTHUMBERLAND.—*E. pusillata* is recorded by Mr. C. Eales in the *Entomologist* for 1872 (page 174) as occurring in Northumberland. Meyrick omits this county.—Id.

BUPALUS PINIARIA, L.—It was, I think, in June, 1890, I called on my way from school at the late Dean Bristow's to get him to name some of my captures. I found him in a great state of delight; he had just returned from a visit to Newcastle, Co. Down, where he had hunted among the pine woods then growing on Slieve Donad. He had captured he said a moth new to Ireland; this was *B. piniaria*, L. Next June I was on Bray Head and there I caught it again. Kane, *Lepidoptera of Ireland*, pp. 106-7, only gives 5 localities (including the above 2) in his first edition. But now this species seems to be abundant wherever there are well established pine woods. It would therefore seem to have come into Ireland along with some imported pine saplings towards the end of the last century, but with its powerful flight to have quickly spread over the whole country. The only other hypothesis would be that it was there and yet escaped notice. But this is hardly likely in the case of so conspicuous a day flyer. I have found it abundant in Co. Kerry at Caragh Lake; in Co. Wicklow around Rathdrum; at Glendalough as well as Bray Head, Co. Dublin and it flourishes at the Scalp. In Co. Armagh it is at Churchill. Co. Down still has it at Donad, at Tallymore, and also around Rostrevor. Mr. Greer gives three Co. Tyrone localities. It has interested me to compare the Scotch specimens with the Irish. In Scotland I have met it on Loch Lomond; in Perthshire at Rannoch, Strathyre, and Glen Lyons; in Argyll at Loch Tulla and Glen Strae. There seems very little difference in colouring between the Irish and Scotch male specimens; both are black and white, the proportion of black and white varying. But it was Strathyre that produced both the blackest and also the whitest specimens. Those from Loch Tulla were appreciably smaller than those from the other localities. Again the Loch Tulla females were the strongest marked, resembling the males in the black markings while the white was instead cinnamon brown. Other females, both Irish and Scotch show very indistinct markings, the cinnamon brown running over the whole wing. Kane, p. 107, mentions var. *flavescens* as occurring at Agher, Co. Meath, but all the males I have met with in both countries are white and black.

If then *piniaria* as now to be found in Ireland is not a native but introduced or re-introduced with the planting of pine, it would seem to have come with saplings from Scotch nurseries not from English and it would be a Scotch colonist.—(CANON) G. FOSTER, B.D., Strangford, N. Ireland.

CURRENT NOTES AND SHORT NOTICES.

NOTE:—All contributors, who wish for reprints, should *mark their M.S. and proofs* stating the fact. These reprints are run off very cheaply. If covers are required a small extra charge is made. As a rule reprints cannot be guaranteed after the issue of the magazine as the type is broken up as soon as convenient after publication.

The Argentine Government have conferred on our valued correspondent Capt. K. J. Hayward, who has held engagements in the country for the past nine years, the highest prize they give for Natural Science, the "Eduardo L. Holmberg," or as it is more commonly known, the "Holmberg" prize. This is given through the national Academy of "Ciencias Exactas, Fisicas y Naturales" and is awarded annually for the most meritorious paper on any Natural Science subject, the Academy having to collect and judge papers, that is to say they are not "submitted," every paper published in the Argentine gets a look in. The prize consists of a gold medal and diploma, and the sum in hard cash of \$2000. This is considered sufficiently important to receive large-type headlines and occupies the place of honour in the daily and provincial papers of the country. The paper was that on the "Argentine Nymphalidae" containing numerous plates and diagrams.

Two meetings of the Entomological Club were held at Oxford on October 1st and 2nd, on the former date Prof. E. B. Poulton in the Chair, and on the latter owing to the regrettable illness of Dr. Eltringham, Prof. Poulton again presided. *Members Present:*—Prof. E. B. Poulton, Mr. Robt. Adkin, Mr. H. Donisthorpe, Mr. H. Willoughby-Ellis, Mr. Jas. E. Collin, Mr. W. J. Kaye, and Lord Rothschild. *Visitors Present:*—Dr. G. D. Hale Carpenter, Dr. F. A. Dixey, Mr. E. B. Ford, Dr. Karl Jordan, Mr. Colbran J. Wainwright, Comm. J. J. Walker, Dr. G. R. de Beer, Dr. S. A. Neave, Dr. R. Hanitsch. The Members and guests met at the Museum during the afternoon of October 1st, and were received by Prof. and Mrs. Poulton, where tea and light refreshments were dispensed by Mrs. Poulton assisted by friends. The Collections and research work in the Hope Department were on view, and the inspection occupied the whole afternoon. A retirement was then made to Jesus College where accommodation was provided for many of the guests. Dinner was served at Jesus College at 8 o'clock, Prof. E. B. Poulton, F.R.S., presiding. A most entertaining evening was spent. On Sunday morning entomological excursions to various localities were organized, which were joined by local entomologists. A return was made to Jesus College at 1 o'clock for Luncheon, after which an excursion was made in rather dull and showery weather by motor cars to Bagley Wood. Owing to weather conditions very little collecting could be done, but the trip was a very enjoyable one. Tea was served in the Keeper's Lodge. A return was made to Jesus College at 6 o'clock, where Dinner was served at 8 o'clock; and in the absence of Dr. Eltringham Prof. Poulton again took the Chair. The meeting was continued to a very late hour. On Monday morning the Hope Department was again visited and the party dispersed during the day. —H.W.-E.

Part 37 of the *Supplement* to Seitz *Palaeartic Macro-lepidoptera* has just come to hand. It contains the completion of the notes on

the additions to the *Sphingidae*. The secondary hybrids are considered, that is the results of crossing hybrids with species and hybrids with hybrids. Those already described are included and also a list of crosses made, but not yet described and named. Two coloured plates of 38 species and forms of *Sphingidae* not previously figured are given. The *Drepanidae* are commenced and of British species with added forms are *Drepana falcatoria*, with 3 new forms, and *D. lacertinaria* with 4 new forms. Full references are given for each species to the main volume, and an excellent feature of the whole work is that there are Lists of full references to all original descriptions. These are appended to each family and not left till the whole work is complete. For instance the list attached to the *Sphingidae* included in this part contains references to the 306 descriptions of the new Sphingid forms.

We seem to get no news of the Paris International Entomological Congress. There are indefinite remarks that it was a very pleasant social gathering. The number of papers to be read was far too great. At one session of two and a half hours no less than twelve papers were down for reading and discussion. No one seemed to know where the subjects they were personally interested in were to be read and discussed. The special journey around the Pyrenees and the S. West of France was far too expensive for the bulk of the delegates in these times, and incidentally those who took part in this last item were not fortunate in the weather.

Part 53 of the huge *Lepidopterorum Catalogus* is to hand. It consists of 320 pages. Of its value we may be assured as it is compiled by Mr. G. Talbot the Director of the Hill Museum of the late J. J. Jocey. But we must protest against the change of form which the editor has made in treating every subspecies or supposed subspecies as an independent species. So accentuated a change seems quite unnecessary from a systematic point of view, as well as breaking the sequence of method followed in the 52 previous parts. We also note that the pedantic, wasteful, ludicrous and incorrect *brassicae brassicae*, Linn., etc., etc., is also used. In dealing with the *Bionomics* of a species the references are usefully classed under, Economic, Embryology, Gynandromorph, Histology, Micrology, Morphology, Parasites, Physiology and Variation. To *Pieris brassicae* there are twelve pages of references; to *Euchloë* (*Anthocharis*) *cardamines* there are nearly eight; while to *P. napi* there are fifteen pages. As usual with Messrs. Junk's work the get up is admirable. This part is a *sine qua non* to all who are interested in the *Pieridae* and fills a much and long desired want.

A pamphlet containing the *Presidential Address to the Lanc. and Ches. Ent. Society* for 1928, by Willoughby Gardner, D.Sc., F.L.S., F.S.A., has reached our table. It contains a most interesting account of "A Lancashire Entomologist in the time of Queen Elizabeth." The subject of the Essay is Thomas Penny, who was born about 1532 the son of a small landowner, and who after a University career, became a Prebend of St. Paul's Cathedral, London. His great interest in natural history and botany made him known to like students of nature both in this country and on the continent, one of his particular friends being the illustrious Mouffet whose subsequent famous book *Insectorum Theatrum* has Penny's name on the title page as one of its authors with Gesner, Wootton and Mouffet. The pamphlet is full of

facts of Penny's life and doings, details of the above book and other publications, which preceded it, such as the work of Aldrovandus, and concludes with a good bibliography of the times. These twenty-four pages make one of the most interesting adjuncts to the history of the Elizabethan period that we have come across.

The Entomological Society of the South of England is fortunate in having among its members more than a couple or so of enthusiastic entomologists to carry on their work. To bring out No. 2 of a *Journal* of 24 pp., to which no less than 17 members contribute notes and Part 1 of vol. III. of *Transactions* of 64 pages in November, is no slight task for the editor in his spare time. The *Journal* is the first to take any notice of the Nomenclature Section of the Paris Congress. Two or three pages of "opinions" expressed are given. Apparently nothing was done, nothing agreed, no backbone in anyone and so for another 3 years shall we potter along. In the *Transactions* the most important article is that on "British *Tipulidae*," Diptera, by H. Audcent with three diagrammatic plates. To dipterists this will prove a very useful account of the species hitherto not available in collected form. The bibliography is long and most praiseworthy. Dipterists are well served in this part for E. Rivenhall Goffe gives a summary of the much disputed "Nouvelle Classification des Mouches à Deux Ailes" 1800, and B. M. Hobby contributes a "Key to the British Species of *Asilidae*." Short articles on other orders complete the number. We only hope that the circulation of the *Transactions* will be commensurate with the great usefulness of the comprehensive articles.

By the kindness of Herr G. Warnecke of Kiel we have received the two published parts of the Noctuid Fauna of the area surrounding Hamburg, the Hamburg-Altona district. They are a summary of the observations during many years of the members of the Entomological Society of Hamburg-Altona compiled by Herr Warnecke. They comprise 50 and 62 pages including a genus index. The notes are full and adequate, not only for local use, but many biological facts are of a wider usefulness, such as unusual food-plants, lines of variation, incidental methods of capture, etc. *Miana latruncula* is treated as a species. The new forms of species occurring in Britain are *basistriata* of *Acronicta auricoma*, *rubrifera* of *Agrotis subrosea*, *purpurisata* of *Mamestra adrena*, and *nigrescens* of *Nonagria sparganii*. Such work as this is most useful both as a basis for future local investigation and as a source of facts and hints in the biology of individual species for the compilation of great general works such as Seitz.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—CENTENARY CELEBRATIONS, 1833-1933.—It has been decided to celebrate the Centenary of the Society on Wednesday and Thursday, May 3rd and 4th next. The celebrations will include a meeting for the reception of delegates and the presentation of addresses on the afternoon of Wednesday, May 3rd, a scientific meeting on the evening of the same day and a conversazione on the evening of Thursday, May 4th.

Further details will be circulated at a later date.—S. A. NEAVE,
Hon. Secretary.

The Council of the Society have had under consideration the question of how best to celebrate the completion of the first hundred years of the Society's existence. So important a landmark in the history of the Society forms a fitting opportunity for reviewing the achievements of the past, and the Council have decided to issue free of charge to all Fellows of the Society in connection with the Centenary Celebrations an illustrated volume containing an authoritative account of the foundation of the Society, its subsequent growth, its incorporation by Royal Charter, and the many-sided developments of recent years. This will, in their view, constitute not only a valuable record of past progress, but will serve also to point the way to new lines of advance.

The Council are anxious that the Centenary Celebrations should themselves be the occasion of a further development in the work of the Society, and they have decided to this end to establish a special fund to be known as the Centenary Fund. They propose that the cost of the Centenary Celebrations (including that of producing the proposed Centenary Volume) should be defrayed from this Fund, and that the balance should be constituted into a permanent Trust Fund to be used at the discretion of the Council, who, subject to the terms of the Trust, will be free to employ either the capital or interest of the Fund for the furtherance of entomology in any way that they may think desirable, provided only that the Fund is not to be used to relieve the general revenue of the Society from existing liabilities.

It is unfortunate that the new venture of the Society last year, the publication *Stylops*, has been a loss to the Society's Funds of about £250, and the Library and Transactions presumably have been deprived of this amount. It is also unfortunate that this should occur with a considerable falling off in the number of Fellows and an unusual number of papers awaiting publication together with large arrears of binding. Further, in these circumstances, and with the present economic general conditions it seems, to say the least, unwise to continue the issue with prospect of a similar loss in 1933. From the entomological point of view it is unfortunate also. On account of the high subscription and the extremely small circulation (not 50 a while ago) the original descriptions will be a continued source of time, trouble and expense to consult.—HY.J.T.

REVIEWS AND NOTICES OF BOOKS.

INSECT BEHAVIOUR.—By Evelyn Cheesman, F.E.S., F.Z.S., 200 pp. illustrated. Small oct. 4/6. Messrs. Phillip Allan and Co. Ltd.—This is a small book but full of facts and thoughts. Facts gathered in many quarters of the wild world, and thoughts induced by the study of those facts as observed in their natural setting. Starting with the fact that even the lowest forms of animal life make definite responses to outside influences, a reflex action, automatic protective attitudes are discussed. Tropism is explained and discussed in its varying forms, chemotropism, heliotropism, periodicity, vibration, communal and individual needs, etc. A good proportion of the matter deals with what is called instinct. Everyone should read onward from page 81 the explanation of the "tandem-flight" of the dragonfly, its purpose to aid

the female to break the water-skin and lay her eggs well below the surface and be pulled up by the attached male, which has remained above the water. Perhaps the most thought-inspiring chapter is that on variation of instinctive behaviour; suggestive with the mass of evidence introduced that insects have no choice of action in anything they do. But in a later chapter it is shown that not all insect actions can be explained as mechanical processes. For beyond the mere record of facts in the life and behaviour of these wonderful little creatures, the dominant inhabitants of this world, this book leads us to think and think under Miss Cheesman's lead, and to see that beneath it all runs the course of evolutionary development in the behaviour of insects from the simple to the complex; as well as it does in their structure and adaptation to their surround. The book is well produced and the print good, fit to pocket for a rail journey or a spare half hour. Miss Cheesman has done well again.—Hy.J.T.

IN DAYS AGONE. Notes on the Fauna and Flora of Subtropical Florida in the Days when most of its Area was a Primeval Wilderness. By W. S. Blatchley, LL.D. 340 pp. and numerous illustrations. \$2.50 net. The Nature Publishing Co., Indianapolis. U.S.A., 1932.—Those who like reading Belt's "A Naturalist in Nicaragua" will revel in this book, replete as it is with incidents in the life of an observant and reflecting, all-round naturalist. Readers of the author's previous book reviewed in this magazine, "My Nature Nook," will like this present book equally well if not more, since it treats of Florida before it was "desecrated by the hand of the white man," and follows up its gradual unnaturalization (civilization in common parlance). The author's sojourn each year has been in the winter months when to live there is generally pleasant, and insect life abounds, and not in the intensely hot summer period when life aestivates to a great extent. The Text consists of Notes from his daily journal and thought thereon. In 1911 he went around the Coasts of Southern Florida and quite half the book describes what he saw, what he discovered and his running comments and quotations. In 1913 and again in 1918 he spent the winter in the Okechobee Wilderness area and the shores of the lakes were worked for insects and plants. In 1919 Cape Sable and Key West the "southern tip" of the United States was his study, and he quotes from R.K. to describe his "demon urge."

"Do you know the pile-built village, where the sago dwellers trade?

Do you know the reek of fish and wet bamboo?

Do you know the steaming stillness of the orchid-scented glade

Where the blazoned bird-wing butterflies flap through?

It is there that I am going with my camphor, net and boxes

To a gentle yellow pirate that I know,

To my little wailing lemurs, to my palms and flying-foxes,

For the Red Gods call me out and I *must* go."

In 1921 to the Everglades and Ten Thousand Islands and in 1922 for the last time to the Lakeland. The book is well produced and creditable to all concerned, but unfortunate that there is no map. The good ship is "spoiled for a haporth of tar," as so many books of this class are. We trust that it will have the circulation it deserves.—Hy.J.T.

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EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr. H. J. TURNER, "Latemar," West Drive, Cheam.

Duplicates.—*S. Andrenaeformis*, Bred 1928, well set on black pins, with data.

Desiderata.—Very numerous British Macro Lepidoptera.—J. W. Woolhouse, Hill House, Frances Street, Chesham, Bucks.

Desiderata.—Species of Dolerine and Nematine sawflies not in my collection; list sent.—R. C. L. Perkins, 4, Thurlestone Road, Newton Abbot.

Duplicates.—*Albimacula**, *sparganii**.

Desiderata.—Ova of *D. oo.* pupae of *X. gilvago*, *D. caesia*. A. J. Wightman, "Aurago," Bromfields, Pulborough, Sussex.

EXCHANGES.—Living Eggs of *Catocala fraxini* and *sponsa*, exchange for butterflies of British Isles.—C. Zacher, Erfurt, Weimar, Street 13, Germany.

Duplicates.—*Pyrallina**, *Salicis*, *Ianthina**, *Orbicularia**, *Repandata* in variety, *Doubledayaria*, *Black rhomboidaria**, *Black virgularia** and others.

Desiderata.—*Hyale*, Welsh *aurinia*, *Polychloros*, *Tiphon Agathina*, *Lunigera*, *Lucerneae*, *Neglecta*, *Diffinis*, *Populeti*, *Gothica v. gothicina*, *White Leporina*, *Tridens Putrescens*, *Littoralis*, *Typhae v. fraterna*, *Rurea v. Combusta*, *Gilvago*, *Fulvago v. flavescens*, *Liturata v. nigrofulvata*. Harold B. Williams, Woodcote, 36, Manorgate Road, Kingston Surrey.

Duplicates.—A large number of species of European and Palaearctic Rhopalocera and Heterocera.

Desiderata.—All British species especially those illustrating characteristics of an island fauna. Dr. Lor. Kolb, München 54, Dachauer-str. 409, Germany, and Franz Daniel, München, Bayer-str. 77, Germany.

URGENT.—Wanted English (Cumberland) *Erebria epiphron*. Adequate exchange will be made in European Lepidoptera.—B. C. S. Warren, 14, Avenue de l'Eglise Anglaise, Lausanne, Switzerland.

I am seeking an opportunity of exchanging Macro- and Micro-Lepidoptera with English collectors and beg to send list of duplicates.—J. Soffner, Trautenu (Bezirksbehörde), Bohemia, Tschechoslowakische Republik.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. March 1st.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. February 23rd, March 9th.—Hon. Secretary, S. N. A. Jacobs, "Ditchling," Hayes Lane, Bromley, Kent.

The London Natural History Society.—Meetings first four Tuesdays in the month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through Members, or from the Hon. Sec. A. B. Hornblower, 91, Queen's Road, Buckhurst Hill, Essex.

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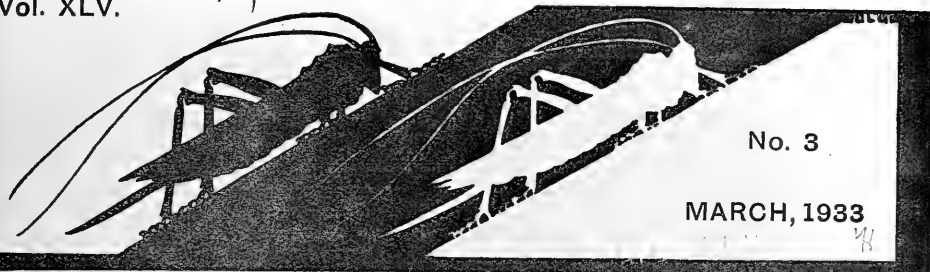
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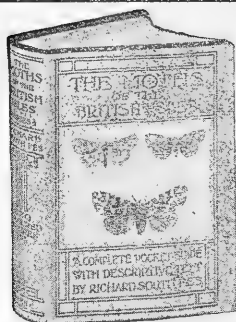
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VALLEY OF MAURIN LOOKING WEST FROM ROAD UP TO THE LAKE.

LEPIDOPTERA AT MAURIN, BASSES-ALPES, FRANCE,

From mid June to September 8th, 1932. (Plate II.)

Based on the Observations of A. E. BURRAS, F.E.S., W. PARKINSON CURTIS, F.E.S., and W. FASSNIDGE, M.A., F.E.S.

(Continued from page 12.)

METHODS OF WORK :—Besides ordinary day-hunting we worked light on every possible night. We set up five lamps on three sheets at distances of from 100 yards to a mile between the furthest stations, and as the valley was worked both down to the gorge and up to the lake it was fairly well covered though no great altitude was attempted. The season was at least three weeks later than normal. Heavy rains and late frosts in June and July must have been detrimental to larvae since few species were really common, and we noted a most unusually large number of more or less crippled specimens. The list shows a large number of species, very few of which were present in any abundance. Only one night during the whole period was warm, when lightning flashed over the Italian border, and two rumbles of thunder were heard earlier in the day. The valley is very gusty and the wind often cold, which seemed to have the greatest influence on the success or otherwise of any given night. Yet we worked at light every night except two at full moon and one other following a wet afternoon, which covered the mountains with snow, when it was too bitterly cold to contemplate standing to a lamp and sheet. Searching flower-heads at night was not particularly productive. Thistles and knapweed paid best, but apart from *Plusia gamma*, L., which was the usual intolerable nuisance at flowers though a rare visitor at light, the bulk of the moths at flowers were *Epipsilia cuprea*, Schiff., *Euxoa decora*, Schiff., *Lycophotia elegans*, Evers., and *L. alpestris*, Boisd. We did not try sugaring, partly because of the accepted belief that it is useless at high altitudes and partly for want of suitable posts. The telephone posts were few and far between and then not always accessible from the road. W.P.C. would like here to say a word of warning about footgear to those who like him are unacquainted with conditions in the Alps. Despite their apparent clumsiness and weight really stout weather-tight boots and really thick socks are a necessity. Thin soles and thin socks rapidly result in sore feet, and rubber is dangerous on wet and mossy rocks.

GENERAL CONSIDERATIONS :—The valley has long been known to coleopterists and botanists as a rich collecting area and, as it is almost completely shut in by mountains of 10,000 feet and upwards, it is reasonable to suppose that it might easily be the home of rare species, local races, variations and aberrations in the Lepidoptera. We took six striking aberrations and a number of minor ones, a remarkable fact considering the general scarcity of Lepidoptera. We took also several species that seem to be very rare in France, and one believed to be new to the French fauna. A glance at the detailed list will show also a curious mixture of southern forms and alpine species, and considering that migrants must travel up the valley only from the S.W., this is the more surprising. Lamping, as we did practically every night, disclosed the fact of three distinct waves of migration or at any rate of movement on the part of *Nomophila noctuella*, Schiff.

The first arrived on the night of August 12th, the day W.P.C. left. A few had been noticed before, and on the preceding night about a dozen or so came to the five lamps. But that night, with only three lamps working, the species came in hundreds, flying continuously as long as we stayed out, that is until 10 p.m. G.M.T. and constituting a very serious difficulty to the capture of any particular specimen that settled on the sheet. Only an odd *P. gamma* came to the lights with them, and by day the only known migrant noted was *Pyrameis* (*Vanessa*) *cardui*, L., of which perhaps ten might be seen daily. The second wave reached us on August 29th when *N. noctuella* came to our lights in thousands with only two or three *P. gamma*, no more than came on the preceding and following nights. A few *N. noctuella* turned up on August 30th; on August 31st we could not lamp owing to the cold N.E. wind already mentioned; on September 1st there was not a single specimen of *N. noctuella* to be seen on our sheets and only three on September 2nd. The third wave came on September 7th when lamping was poor with a half-moon behind the mountains and a chilly wind. This time there were about thirty *P. gamma* during the evening and *N. noctuella* came at the rate of about ten a minute. It should be remembered that *P. gamma* is not a markedly positive phototropic insect, and W.P.C. abandoned trying to work flowers in some still uncut meadows on August 9th and 10th because 98 per cent. of his captures were *P. gamma*, yet it rarely came to the sheet. Of other possible wanderers one *Sideridis vitellina*, Hb., was seen on September 4th, while a few *Polygonia c-album*, L., *Pyrameis* (*Vanessa*) *atalanta*, L., and *Colias croceus*, Fourc., were noted in the first week in September. One very fresh *Celerio lineata*, Fb., forma *livornica*, Esp., was brought in by the gendarmes, and three odd specimens of *Herse convolvuli*, L., were noted also in the first week of September. Larvae of *V. cardui*, L., were moderately abundant on several species of thistle, notably on *Carlina acaulis*, L., during part of our stay, and a fair number of larvae of *P. gamma* were found feeding on various low plants toward the end of our holiday.

Two species raise to our mind points, which the wider experience of other entomologists may be able to solve. How does one capture ♀ ♀ of *Erebia scipio*, Boisd.? The species wandered into the village itself and odd ♂ ♂ were picked up here and there, though they were always to be found in the steep torrent beds that score the slopes on the northern side of the valley, where they flew up and down in company with *E. goante*, Esp. W.F. caught two ♀ ♀ only, one flying high over a pool where he was dabbling his feet, and the other he netted quite casually on the road. Then how can larvae of *Celerio vespertilio*, Esp., be induced to pupate healthily? These larvae were found in some abundance feeding on *Epilobium rosmarinifolium*, Haencke, growing in the stony bed of the Ubaye. When small they hid under stones by day, but in their last instar they basked in the sun on the bare ground between the plants. They ceased to feed in captivity when full-fed and then simply did nothing. Some of them spun a few feeble threads and then turned black and rotten. Even some of those few that succeeded in changing to pupae went rotten soon after the change, and at present W.F. has two healthy pupae from at least sixty larvae taken in their last instar. A.E.B. was no more successful and we should be glad to hear from anyone who can explain our lack of success.

LIST OF LEPIDOPTERA OBSERVED AT MAURIN, BASSES-ALPES.

We have thought it best to follow the *Catalogue des Lépidoptères français* published by Léon Lhomme, begun in 1923 and now almost ready to begin the *Crambidae*, as this is the latest catalogue dealing with this faunistic region. For the *Crambidae* (*Pyralidae*) we follow the same author's MS. list, and for the *Tortricina* and *Tineina* Spuler's *Die Sogenannten Kleinschmetterlinge Europas*, 1913.

RHOPALOCERA.

Papilio podalirius, L.—A few; A.E.B. *P. machaon*, L.—Not common; fairly typical; the dark margins are a little broader than in German specimens but not so wide as in subsp. *britannicus*, Vrtý., or as in some Portuguese examples. *Parnassius apollo*, L.—Fairly common; race *geminus*, Stichel, was the most numerous; a few ab. *montanus*, Stichel, and two ab. *provincialis*, Kheil, were taken by W.P.C. *P. delius*, Esp., (*phoebus*, Prun.)—Fairly common; local in the Vallée de Mary; all belonged to race *sacerdos*, Stichel. *Aporia crataegi*, L.—Fairly common especially below Le Barge. *Pieris brassicae*, L.—Fairly common. *P. rapae*, L.—Fairly common near dwellings. *P. manni*, Mayer.—Fairly common on the northern slopes of the valley. *P. napi*, L.—Fairly common; the ♂♂ mainly ab. *impunctata*, Röber; ♀♀ very near ab. *bryoniae*, Ochs. *Pontia* (*Leucochloë*) *daphidice*, L.—Rare. *Synchlōë callidice*, Esp.—Fairly rare; wild and wary; scattered, but chiefly on the northern slopes of the valley; ♀♀ very rare. *Euchloë crameri*, Butler.—Common; the form appears to be *esperii*, Kirby, mixed with *ausonia*, Hb., ab. *aurantiaca*, Obth., and ab. *grisescens*, Obth.; larvae very common on a yellow flowered Crucifer growing in stony places. *Anthocaris cardamines*, L.—Fairly common; lasted till well on into August. *A. euphenoides*, Stgr.—One ♂, W.P.C. *Gonepteryx rhamni*, L.—Fairly common. *Colias phicomone*, Esp.—Fairly common and very wild; both sexes much suffused; some of the ♂♂ approach ab. *oberthuri*, Vrtý. *C. hyale*, L.—Fairly common. *C. croceus*, Fourc.—Rare until mid August; after this date fairly common, no ab. *helice*, Hb., were seen. *Leptosia* (*Leptidia*) *sinapis*, L.—Fairly common, especially below Le Barge. *Erebia epiphron*, Knoch, var. *cassiope*, Fb.—Common everywhere above 7,000 feet. *E. gorgophone*, Bellier.—Rare at 8,000 feet and over; Font Sancté, Grand Bois above lake; compared by W.P.C. with types in the British Museum. *E. stygne*, Ochs.—Fairly common and well distributed. *E. scipio*, Boisd.—Fairly rare; ♂♂ in the dry torrent beds on the northern slopes. *E. goante*, Esp.—Fairly common; partial to stony places and rock walls partly shaded with larches. *E. gorge*, Esp., ab. *erynnis*, Esp.—Rare; vallée de Mary, W.F. *E. neoridas*, Boisd.—Fairly rare. *E. euryale*, Esp.—Very common among larches; rather variable; aberrations approaching *ocellaris*, Stgr., and *euryaloides*, Tengs., occurred; W.P.C. got an odd looking specimen, wings very ample and round, band very deep strong Sandford's brown, ocelli blind, white spotting of cilia nearly obsolete. *E. lappona*, Esp.—Fairly rare and scattered, W.F., A.E.B. *E. tyndarus*, Esp.—Common and typical. *Melanargia galathea*, L.—One specimen, var. *procida*, Herbst., W.P.C. *Satyrus semele*, L.—One specimen, A.E.B. *Nytha* (*S.*) *cordula*, Fb.—W.P.C. saw several specimens or the same specimen on successive

days of what looked like this species, but was not able to catch it. *Pararge aegeria*, L.—One specimen, A.E.B. *P. megera*, L.—Two or three seen. *P. maera*, L.—Rare. *Epinephele lycaon*, Rott.—Fairly common in the valley. *Coenonympha iphis*, Schiff., race *carpathica*, Horm.—Common in moist meadows: seen by W.P.C. drinking at the gutters in the streets of Barcelonnette. *C. philea*, Hb. (*arcania*, L.?) var. *satyrion*, Esp.—Rare, A.E.B., W.F. *Limenitis camilla*, Schiff. A few below Le Barge. *Pyrameis (Vanessa) atalanta*, L.—Scattered specimens; more in early September. *P. (V.) cardui*, L.—A few; more common in early September; larvae fairly common. *V. io*, L.—Odd specimens. *Aglais urticae*, L.—Fairly rare; larvae fairly common. *Polygonia c-album*, L.—A few in early September. *Euvanesa antiopa*, L.—Two broods of larvae seen on the willows; just beginning to emerge in early September. W.F. noted larvae hanging up for pupation that must have wandered more than 100 yards, each attended by Chalcid parasites observed in one case on three successive days waiting for the chance to oviposit in the soft newly formed pupa. *Melitaea cynthia*, Hb.—Two ♂♂ seen by A.E.B. *M. cinxia*, L.—Fairly rare. *M. phoebe*, Knoch.—Fairly common; A.E.B. took a striking aberration, unfortunately with a crippled hindwing; W.P.C. took a very beautiful obsolete form described at the end of this paper. *M. didyma*, Ochs.—Common; ♂♂ very red; ♀♀ forma *alpina*, Stgr., sometimes so extreme as to show very little trace of fulvous. **M. parthenie*, Bork.—Fairly common below Le Barge. *M. varia*, Meyer-Dürr.—Rare on the high pastures. *M. dictynna*, Esp.—Fairly common and very dark. *Brenthis (Argynnis) selenis*, Schiff.—A few low down in July and early August. *B. (A.) euphrosyne*, L.—Fairly common with the preceding; undersides much redder than English specimens. *B. pales*, Schiff.—Fairly common both in low meadows and on high pastures. *B. amathusia*, Esp.—Rare opposite Le Barge. *A. aglaia*, L.—Common especially in low meadows; undersized and pale; no tendency to variation. *A. niobe*, L. and ab. *eris*, Meig.—Both equally fairly common. *Issoria lathonia*, L.—Fairly common in the valley. *Callophrys rubi*, L.—Common at the end of June, A.E.B. *Strymon spini*, Schiff.—Fairly common at flowers of thyme. *Heodes virgaureae*, L.—Fairly common in the valley; W.P.C. took a ♀ ab. *albo-punctata*, Huene. *H. chryseis*, Bergs.=*hippotoë*, L.—Fairly common; the usual alpine form. *H. alciphron*, Rott. var. *gordius*, Sulz.—One very fine ♂, A.E.B. *Rumicia phlaeas*, L.—Four specimens, all very large. *H. dorilis*, Hufn., form *subalpina*, Speyer (*montana*, Meyer-Dürr.).—Fairly common; this form is by some considered a separate species. *Cupido minimus*, Fuess.—Common; in the river valley normal to rather large, on Font Sancté very small indeed. *Plebeius argus*, L.—Common; ♂♂ at the wet mud round the lake. *P. aegon*, Schiff.—Common and rather small. *Aricia (P.) medon*, Hufn.—Common; mainly race *allous*, Hb. *Aricia (P.) donzeli*, Boisd.—Common everywhere among larches. *P. pheretes*, Hb.—♂♂ fairly common at roadside puddles; ♀♀ rare in larch woods. *P. orbitulus*, Prunner.—Common at wet places in the hot sunshine. *Polyommatus icarus*, Rott.—Fairly common. *P. thersites*, Cant.—Common. *P. dorylas*

* Dr. Verity suggests that *parthenie*, Bork.=*aurelia*, Nkrl. (*Ent. Rec.* p. 27 etc., 1932).

(*hylas*, Esp.), Schiff.—Fairly common; very variable in size. *P. escheri*, Hb.—Fairly common. *P. coridon*, Poda.—Fairly common; mostly referable to ab. *punctata*, Tutt; W.F. took ab. *cinnus*, Hb. *P. damon*, Schiff.—Very common; the ♀♀ tended to ab. *caerulescens*, Obthr. W.P.C. took ab. *extensa*, Krod., and W.F. took two minor striated forms. *P. semiargus*, Rott.—Common low down. *P. eumedon*, Esp. (*chiron*,)—Fairly common at the end of July. *P. eros*, Ochs.—Very common; W.P.C. and W.F. took striated forms, and W.F. took an obsolete form. *Turanana baton*, Bergs.—Three ♂♂. *Glaucopsyche cyllarus*, Rott.—Fairly common in July; still about in fair condition in early August. *Lycaena arion*, L.—Locally fairly common; form *obscura*, Christ. *Lycaenopsis argiolus*, L.—A few below Le Barge in early September. *Carcharodus althaeae*, Hb.—Two specimens, W.P.C. *Hesperia carthami*, Hb.—Fairly rare low down. *H. alveus*, Hb.—Fairly common; some specimens are very small and dark. *H. serratulae*, Rmbr.—A few, W.F., W.P.C. (genitalia examined). *H. carlinae*, Rmbr.—Fairly common. *H. cacaliae*, Rmbr.—One or two, W.P.C. *H. andromedae*, Wall.—Rare; near torrents. *H. malvoides*, El. (gen. ex.) and Edw.—Fairly rare; found right up to the snow. *H. sao*, Bergs. (recte *sertorius*, Hoffm.)—Fairly common. *Nisoniades tages*, L.—Common in July, A.E.B. *Adopaea lineola*, Ochs.—Common. *A. flava*, Brünn. (*thauwas*, Hufn.)—Common. *Urbicula comma*, L.—Fairly common. *Angiades sylvanus*, Esp.—Fairly common in July, A.E.B.

(To be continued.)

Notes from Ireland.

By CANON G. FOSTER, B.D.

Last winter Mr. Turner was kind enough to go through a selection from my *nictitans* group, which till then I had been leaving undifferentiated. It would perhaps be useful and interesting to record the results of his examination. The specimens submitted to him have been drawn from four different Irish counties, namely Wicklow, Armagh, Down, and Donegal. There is no record for *paludis*, but *lucens*, *crinanensis*, and *nictitans* all show in varying proportions—*lucens* 3, *crinanensis* 28, *nictitans* 13. But the county of the four for *crinanensis* seems to be Donegal, since out of the 28, 25 were from Donegal, as also two of the three *lucens*, while Donegal gave no records of *nictitans*. Wicklow shows one *lucens*, one *crinanensis* and four *nictitans*. Armagh gives one *crinanensis* and five *nictitans*, while Down gives one *crinanensis* and four *nictitans*. Three localities in Donegal were worked, Donegal town, Portnoo, and Gartan. Donegal town was a failure as none of the three showed. At Gartan I was handicapped by bad health, but I captured 9 at light, on ragweed, or on *Buddleia variabilis*. All were *crinanensis* except one doubtful. But at Portnoo *crinanensis* was in profuse abundance and the specimens were of very large size. They were so fine that I could scarcely persuade my son to stop taking them. They were most frequent on ragweed, but were also to be got on heather blossom. The ragweed grew on the land side of the sand hills along a marshy drain, while the heather was inland among rocky hills.

In Co. Wicklow I only worked one locality, a sort of amphitheatre along the Avonmore River below Rathdrum. There it was the scabious flowers that attracted them, and they were just as abundant by day as by night, sometimes more so.

The Co. Armagh locality was near Lurgan on ragweed growing in marshy meadows close to Lough Neagh.

In Co. Down my specimens are drawn from two localities, Kirkcubbin and Strangford, both near the sea. The ground varies, either sandhills, or ordinary rough pasturage. Of course one could capture them by the hundred, but Co. Down seems to produce mostly *nictitans*, also Armagh and Wicklow, while *crinanensis* seems to be supreme in Donegal. Here, Strangford, Co. Down, *nictitans* is very abundant but I have not met with either *crinanensis* or *lucens*.

The inference therefore to be drawn seems to be that *nictitans* holds the field in Cos. Down, Armagh, Wicklow, with erratic appearances of *lucens* and *crinanensis*, while in Donegal *crinanensis* is the dominant species.

	Donegal	Down	Armagh	Wicklow	Total
<i>crinanensis</i>	25	1	1	1	28
<i>lucens</i>	2	—	—	1	3
<i>nictitans</i>	—	4	5	4	13

Mr. Thos. Greer in his "Macro-Lepidoptera of County Tyrone," has some very interesting observations on the subject. He speaks of *crinanensis* as altogether replacing *nictitans*. Again in his "Lepidoptera of the North of Ireland" p. 49 he says "nearly all specimens recorded as *H. nictitans* are referable to the present species. Generally abundant in marshy localities in Cos. Donegal, Derry, Antrim, Fermanagh, and Tyrone." From Lough Neagh west therefore as regards the North of Ireland it is *crinanensis*, but eastward, Armagh and Down, *nictitans*. However it will be necessary to collect more material from other localities in Co. Down, before a valid conclusion as to the Co. Down and Armagh distribution can be drawn. Again as regards Co. Wicklow, on the coast *crinanensis* seems dominant (*vide* Greer "Macro-Lepidoptera Tyrone" p. 15), while inland it was *nictitans* I found supreme; in both cases *lucens* in the minority.

Orthoptera and Spiders.

By MALCOLM BURR, D.Sc., F.E.S.

The literature of spiders is not always considered by entomologists, and so I think it worth recording separately some interesting observations upon Orthoptera which I have chanced upon when reading the English translation of Nielsen's great work, *The Biology of Spiders* (Copenhagen, 1932, Vols. I. and II.)

1. *Fight between an earwig and a spider* (I., p. 87). "One morning the female of a *Clubiona* had left her retreat: she went beneath the leaf, where she found an earwig, which at once put itself on its defence with the outstretched forceps bent up above its back. Whenever the spider made an attack, the earwig quickly made a dash at the enemy with the forceps, and the spider hurried out of reach of the dangerous weapon. The attack of the spider was repeated several times, until at last the earwig withdrew."

Clubiona is a genus of inconspicuous tube-building spiders. As they are small creatures, it is much to the credit of this one that it was left in possession of the field. The behaviour of the earwig was characteristic.

2. *Locusta viridissima* attacks a butterfly. (I., p. 148). "A *Locusta viridissima*, L., was sitting on a big leaf in dense vegetation and was not very conspicuous in its green dress. It incessantly moved its antennae, and the whole of its attention was centred on a butterfly that was basking in the sun on a neighbouring leaf. Suddenly the grasshopper jumped on to this leaf straight at the butterfly, which, however, flew away; still it was not more frightened but that it returned to the same leaf, where the grasshopper was now sitting. From the antennae of the latter it was apparent that the grasshopper had immediately discovered the return of its prey and was preparing for a fresh jump. It, however, again missed its aim; and the butterfly circled above the place and then for the third time settled close to the green leaper. Now the grasshopper leaped for the third time but was again unsuccessful and this time the butterfly did not return."

"The fact that the butterfly kept on returning to the same spot in spite of the presence of such a dangerous enemy, which each time made an attempt on its life, would seem to suggest that it did not perceive the grasshopper as long as it kept quiet, only becoming aware of its big body when it had pushed off and was in the act of jumping. This interesting scene between *Locusta* and the butterfly shows the quick apprehension of the latter and the lightning rapidity of its reaction with respect to a body in motion, but it also indicates either a very short memory, or an entire unconsciousness of the kind of object rushing at it three times; when each time the butterfly flew away from the locust, this may be owing to an instinct inciting it to escape whenever an object of size is approaching it." (p. 149).

"When the observer, after the disappearance of the butterfly, came close to the grasshopper, it darted down among the leaves and disappeared; from this it may be inferred that, when hunting the butterfly, it remained in the light, trusting to be concealed from the latter by its colour; its confidence failed, however, when it felt its own life threatened. I have seen many locusts sitting on broad leaves among herbs and every one of them disappeared into the depths when I approached."

The occasion of this quotation is an account of the protective coloration of the crab-spiders, *Laterigradae*. The disappearance of the *Locusta* is characteristic, but I have never before heard of one actually attacking a living creature in a wild state.

3. *Grasshoppers eaten by spiders*. (p. 109). "*Agalena's* chief nourishment is grasshoppers, and the stopping-web is an excellent expedient for stopping the jumping animals. The spider always sits at the mouth of the retreat, but with grasshoppers the mode of procedure is different. *Agalena* rushes at the fallen animal, bites it, retires quickly, and soon after rushes out again trying, by biting the animal once more, to stop its violent movements; often it bites off the saltatorial legs before carrying the booty into the retreat."

This behaviour is different from that observed by me in Madeira, when I saw an *Eparchromia* leap right into a big wheel-shaped web. It started kicking and did considerable damage to the web: the spider

dashed out at it at once, seized it by the two ends, holding it up as a squirrel holds a nut, and twirled it rapidly while it enveloped it in its silken thread, passing it from end to end with the same motion that a cable is wound upon a drum. In a trice the strong grasshopper was helpless, tightly swathed, when the spider left it and returned to her lair.

Notes on Erebiid Species.

By B. C. S. WARREN, F.E.S.

(1) Races of *E. ottomana*.—In the December number of this Magazine (1932), I mentioned a race of this species taken by Herr Dannehl near the lake of Garda.

For the last eighteen months Herr Dannehl has been selling this insect under the name *benacensis*, but in spite of frequent assurances on his part that his description of this name would shortly appear, it has not yet been published. I have refrained from publishing this name before, but it causes the descriptions of other races to become unnecessarily involved to continue referring to a race without a name, and one cannot continue doing so indefinitely. I therefore describe this race now under the name which it has been sold and exhibited under during last year.

E. ottomana ssp. **benacensis** nov.—This race resembles the ssp. *balcanica*, Rbl., but differs in being much darker on the upperside, the rusty patches around the apical spots on the forewings being reduced to mere rings, and the spots on the hindwings to mere points, in some cases hardly visible. On the underside of the hindwings, especially in the ♂s, *benacensis* is strongly banded and therefore strikingly different from *balcanica*. The antemarginal band in the ♀ is also better marked than in the ♀ *balcanica*. The size of the two races is the same; but the very dark upperside renders *benacensis* easily distinguishable from *balcanica*. Types from Mte. Baldo near lake Garda; in my collection.

E. ottomana ssp. **bureschi** nov.—This race is characterised by having the great size of typical *ottomana*, but the underside facies of *benacensis*; many specimens are actually larger than typical *ottomana*, but there is some variation in the size which ranges from 44-50mm. in the ♂; the only ♀ I have seen measuring 49mm. (The average size of typical *ottomana* is 43-46mm. in both sexes; *benacensis* and *balcanica* are of course much smaller). The markings of the upperside are as in *ottomana*, but slightly more pronounced. As well as its greater size, *bureschi* differs from *ottomana* in that the underside of the hindwing is marked as in *benacensis*, having the ground colour, which shows through the blue-grey super-scaling, more black-brown and not golden-brown as in *ottomana* or *balcanica*, and therefore the median and marginal bands appear much more strongly developed, and look much darker as is the case in *benacensis*. This darker appearance and the much greater prominence of the bands, distinguish *bureschi* very clearly from both *ottomana* and *balcanica*; the far greater size, of course, further distinguishes it from the latter and *benacensis*. The large black spots on the upperside and the greater prominence of the rusty bands, also distinguish it from the latter. The underside of the

♀ is variable in all four races, but is less unicolorous in the one ♀ of *bureschi*, for the basal and antemarginal bands are a pale blue-grey, more the colour of the underside of the typical ♂ *ottomana*. Types from the Alibutush, in the extreme southern end of the Perim mountains.

A good idea of the great size of *bureschi* is gained by the fact that many specimens are larger than the typical *pronoë* from the Austrian Alps.

(2) *E. callias*.—I have recently obtained material which has enabled me to establish the identity of a remarkable Asiatic race of this species, which has been confused with the ssp. *altajana*. This new form is so like typical *callias*, that it would be correct to refer it to the latter if it were not for the fact that anatomically it is proved to be a form of the ssp. *sibirica*.

E. callias ssp. *sibirica* form **simulata** nov.—This form differs from *sibirica*, Stg. in having three distinct black spots set in rusty rings on the upperside of the hindwings; often containing white pupils. Occasionally there are also two extra spots on the forewings, below the usual two apical ones. The insect is therefore so similar to typical *callias*, that excepting its large size—equal to that of *sibirica*—and somewhat brighter coloration on the underside, there is no superficial means of distinguishing them. Anatomically, however, they can easily be distinguished by the characters of the clasp, which are peculiar to *sibirica*. For this reason it is necessary to give this Asiatic imitation of *callias* a name. The form has been referred to ssp. *altajana* in the past, but is easily distinguished from the latter by the less extended reddish patch on the upperside of the forewings, and the consequently broader margin of ground colour showing along the outer margin of the wing. This dark margin is twice the width that it is in *altajana*. All the black spots are also smaller in *simulata*, and the insect is larger. It occurs racially in the Tunkun mountains, and the central district between the East and West Sayan mountains; also in the Tannuola mountains in North-west Mongolia; and aberrationally wherever ssp. *sibirica* occurs.

I cannot deal with the anatomical formations of *simulata* here, it would necessitate long descriptions of the structural details of both *sibirica* and *callias* as well as other species, also extensive illustration. Full details will I hope be published eventually. I would only add, that though in a high percentage of specimens there is a recognisable difference in structure between *sibirica* and *callias*, this difference does not attain either a specific constancy or stability of formation.

(3) *E. pronoë*.—In connection with this species it is necessary to make a change in one of Fruhstorfer's names. His *zyxuta*, the Balkan subspecies, incredible as it may seem, falls as a primary homonym. This, of course, only because Fruhstorfer had forgotten that he had already made use of this strange compound—one can hardly call it a name—in the genus. In this case the change will not be likely to be regretted by anyone. I would substitute the name ssp. **fruhstorferi** nov. pro *zyxuta*, Frhst.

Cornish Notes for 1932.

By CHARLES NICHOLSON.

I shall first refer to the "Nature Story," which appeared on pp. 11-12 of the last volume, to say that I subsequently saw the writer of that story, from whom I elicited the information that the beetle in question was a Musk-beetle (*Aromia moschata*), but I got no light on the subject of the wonderful name it was given in the story. From what I could gather I have no doubt at all that the "parasite" was one of the mites (*Gamasus coleopratorum*) so commonly found on *Geotrupes*, but how it found its way to *Aromia* is not easy to imagine.

Although I have again had no time for any systematic collecting I have seen enough to be able to dissent vigorously from all those reports that lament the poorness of the season of 1932. Possibly the S.W. of England has not been cursed in that way, for here in Cornwall the season has been quite up to the average, so far as my limited experience of the average goes, in numbers of lepidoptera, although there have been no sensational appearances to record.

The feature of 1932 seems to have been an unusual abundance of *Dasychira pudibunda* larvae, of which I have had not a few shown or given to me for identification by people in different parts of the village, and I was rather surprised to pick up just inside our entrance gates on July 10th a dead oak twig on which a batch of some 400 eggs of this moth had been laid. I brought them in and on the 13th they hatched. Not wanting them I then turned them out in the garden, but never saw any sign of them again!

The young larvae of *Lasiocampa quercus* var. *callunae* referred to in my notes on pp. 41-2 of last volume began to emerge as moths on July 16th in the garden shed where they were kept throughout, and the last one a fine ♀ appeared on August 3rd. They were all typical *callunae*, which thus breeds true although the larvae did not go through two winters. I again "sembled" and got three pairings from which I have some 50 larvae feeding on bramble. I may add that of the hundreds of larvae I turned out in various parts of the garden last year I saw only two and they were nothing but empty skins (lying on the ground) of nearly fullfed individuals. These were not simply cast skins, but the larvae had evidently been sucked dry by something, as both skins were fully extended and had not been long where I found them evidently, or I should have seen them before. I have never met with a case of this sort previously.

In August I received from the keeper of Round Island Lighthouse, Scilly, a pair of *Pachygastra trifolii* and in the paper with them were 4 eggs, which I am keeping to see if they will hatch, so that I may rear them and "semble," if possible, to see if the species occurs in this district. I am at any rate in the fortunate position of having nearly all its recorded foodplants in my garden, including *Anthyllis vulneraria* (Kidney vetch) which is quite likely to be the favourite one on Round Island!

On June 7th I boxed a specimen of *Gnophria rubricollis* flying in the sunshine in the garden—the first I have seen of this species here. On August 24th I saw a *Mania maura* that had been squashed flat on the main road by a motor, and it reminded me of the well-known illustrations of "*Archaeopteryx* remains in situ" in the text-books!

Anaitis plagiata turned up as usual—in the verandah this time—and no doubt it feeds as a larva on one or more of the half-dozen species of St. John's Wort, wild or cultivated, that grow in the garden. I boxed one *Lobophora (Acasis) rivetata* in the verandah on August 27th and am surprised this has not turned up before, as there is plenty of holly and flowering ivy on my "estate"!

Dysstroma truncata was very much in evidence in the verandah and a rather pretty form turned up in some numbers that I have not seen anywhere before. This was a dark *centum-notata* form without any brown colouring, but with an oblong grey-black blotch occupying the the apical portion of the forewing and divided by the usual pale wedge-shaped upper end at the characteristic angled line; this form was quite as common as *perfuscata*, the prevailing form here, but *centum-notata* was sparingly represented and *comma-notata* more sparingly still. As usual I never see the first brood of this species here, and the second usually appears in August and continues out for some months; the last specimen—a worn *perfuscata*, was seen in the verandah on October 31st. I was very surprised to find on the sitting-room window on the evening of January 28th a nice specimen of *Calostigia (Malenydris) multistriata*—a decidedly early date, and the first I have seen of this species here. On August 26th a *Lyncometra ocellata* and a *Ligdia adustata* were noticed in the verandah. Although *Euonymus* is abundant about here and there are several bushes in the garden this is only the second *adustata* I have seen. On August 10th I was pleased to see *Synanthedon vespiformis* again, in the shape of a pair in cop, on a leaf of *Atropa belladonna*, which is growing in close proximity to, and between, two old oak-stumps from one of which no doubt the moths emerged. On August 28th the only *Nomophila noctuella* seen last season was noticed in the verandah on a sunny afternoon. On October 2nd and November 25th respectively a good specimen of *Scopula ferrugalis* was boxed on our "net-window," evidently attracted by the light. The end window of the bay of our sittingroom looks along the verandah and the top section of it is a transom, opening outwards from the bottom by hinges at the top. In order that this window may be open in the evening we stretched mosquito-net over the framework to keep out gnats and mosquitoes with the result that when the window is shut there is a space between the glass and the net about 2 feet square by 3 inches deep. Moths and other insects are attracted by the light in the room and fly up into the space when the window is open, and as I shut the window when we go to bed the insects are trapped and I examine them in the morning. As a moth trap it was as effective as one could expect seeing that the light in the room did not shine directly through it, but as a medium for the capture of rarities I cannot claim it as so successful as a direct light shining over the garden might have been. As a sample bag the following were found in the net-window trap on the morning of August 29th, moths having been particularly abundant in the verandah the evening before: 4 *Noctua c-nigrum*, 4 *Opisthographtis luteolata*, 4 *Dysstroma truncata* (these were 2 *perfuscata*, 1 *centum-notata* and 1 *comma-notata*), 2 *Plusia gamma*, 1 *Epirrhoë sociata*, 1 *Ochyria designata*, and a small lacewing, besides sundry small flies. Moths were also exceptionally abundant in the verandah on August 23rd and 3 bats were busy during the evening and must have reaped a fine harvest! It

was noticeable that *Apamea secalis* (*didyma*) although quite as common as *N. c-nigrum*, was apparently not attracted to the light as I found none in the "trap." I believe the primary attraction to many of these moths was a plant of *Clematis flammula*, which had a mass of its almond-scented flowers in the verandah and as many more outside, and that the verandah itself with its glass roof just above the flowers acted as a kind of preliminary trap, many of the moths on leaving the flowers flying up to the glass just above them and then gradually finding their way along until they came within the influence of the light, which kept some of them busy until they entered the "trap." No doubt also a plant of *Clematis viticella* at the "trap" end of the verandah helped to attract some, as *Plusia gamma* seems very partial to its flowers and I several times saw other moths visiting them, though they are practically scentless. The interesting form of *D. truncata* I referred to above did not appear in any numbers until September (the first one on the 4th) and it gradually exceeded even *perfuscata* in prevalence.

(To be concluded.)

NOTES ON COLLECTING, etc.

ITEMS FROM NEAR WINCHESTER, ETC., IN 1932.—*Callophys rubi* ab. *immaculata* was captured at Winchester, and at Crabbe Wood the larva of *Pyrameis cardui* were numerous. At Ampfield Wood *Brenthis selene* was reported in abundance and in Winchester itself a *Limenitis sibilla* was seen, and on Oct. 19th, a solitary *Colias croceus* was observed. Near Tavistock (S. Devon) *Dryas paphia* was very common occurring in the gardens, where also a *C. croceus* was noted. It was reported to me by the late Mr. John Chichester that he once saw two *Euvanesa antiopa* on a dung heap at Horrbridge. Bleached specimens of *Epinephele jurtina* were taken and seen near Liskeard. Everything has been very scarce and late as a rule, the whole season.—P. C. HAWKER, Kingsgate House, Winchester.

LITHOSIA PALLIFRONS AND L. PYGMAEOLA.—In the *Ent. Rec.*, 1932, p. 8-9, there is an interesting note on *Lithosia pallifrons* and *L. pygmaeola*, in which Mr. Kettlewell writes that, according to preparations made of the genitalia by Mr. Tams, *pygmaeola* is a form of *L. pallifrons*. This result struck me very much. *Pygmaeola*, formerly considered as a form of *L. lutarella*, is not uncommon in the dunes of Holland along the North Sea. Count Bontinck, one of our leading Dutch lepidopterists, who possesses a fine series of *pygmaeola*, proved already many years ago, that the genitalia of this form and of *lutarella* are quite different. Up to some years ago *pallifrons* was hardly known as an inhabitant of Holland, but the last few years Count Bontinck has succeeded in capturing a good series of this species by means of electric light. An examination of their genitalia gave the following result: they differ strikingly from *lutarella*, less from *pygmaeola*, yet the difference is great enough to consider them as separate species instead of treating *pygmaeola* as a form of *pallifrons*. A note on the differences among the three species with figures of their genitalia is to be found in *Lambillionea*, 1930, p. 43-44, also 1931, p. 75. There is still another solution of the problem: viz. that our Dutch *pygmaeola* is a different species from the

English. The Dutch examples are much larger than the English, so at any rate they constitute a distinct race. It is to be hoped that Mr. Tams will give us a definite solution of this interesting question in which Count Bentinck (address: Overveen—Holland) will certainly assist him.—B. J. LEMPKE, Amsterdam.

EPINEPHELE JURTINA, L., AB. SEMIALBA, BRUAND.—Could any of the readers tell me, where the original description of this form is to be found? The librarian of the Soc. Ent. de France has looked for me in all publications of Bruand he could consult, but without any success. Tutt mentions the form in his *Brit. Butt.*, 1896, from which Rebel very probably copied it. The *Lep. Cat.* writes: "vide Verity, *Entomol.* 37, p. 56 (1907)," and Dr. Verity himself referred me to Tutt! I should be much pleased with any information.—B. J. LEMPKE, Amsterdam.

BLACK-VEINED BROWN BUTTERFLY.—Mr. K. Trenchard Cox may be interested to know that about two weeks ago I discovered a black-veined brown (Monarch) butterfly on a large sedum in my garden; its wing span was certainly not less than 3in. At that moment circumstances did not permit of my photographing it, and although during the following days I looked for it many times, I never saw it again, though at times there were as many as 22 small tortoiseshells on the plant. I cannot recollect having seen a live specimen before.—Mr. ERIC H. HEWETT, 20, Somerset Gardens, Bognor Regis, Sussex. (*The Times*, Oct. 5th).

[Has any one of our readers met with this immigrant? Recently we received a note of another very casual immigrant, but the writer subsequently found his capture was not the species reported.]

FURTHER NOTES FROM KABYLIA.—During the season 1932 we have been able to discover some new localities and add to our list of species taken in this region of the Djurjura Mountains.

1. *Charaxes jasius*.—This beautiful insect was quite moderately common at Dellys on the coast after August 10th, and as my friend Mademoiselle Rocchiatti reports it from Tizirt further down the coast at the same date, it is probably to be found all along this part of the Mediterranean littoral. I have not yet discovered it in the Djurjura Mountains. It would be of interest to know if this insect occurs inland or is it confined to the littoral?

2. *Libythea celtis*.—This species is more widely distributed in this region of the Djurjura than we had thought. We have discovered it in a number of new localities *i.e.*, Ait Ailem, 2.iv; Ait Daoud, 4.iv at a distance of at least four hours from Michelet; Tagonits in the Plain of the Sebaon River on 30.iv, settled on the "Chêne Zéen"; at Ouazene two kilomètres from Michelet on 1.v; and at Tirourda on 17.vi at a distance of about six hours from Michelet.

3. *Euchloë charltonia*.—I was delighted to capture two specimens of this very beautiful little insect near the Kabyle village of Aguemoun Izem on May 7th. This is the only locality so far where I have seen it; so I am inclined to think it is very local in this district.

4. *Melanargia syllius*.—This species is well distributed on the mountains around here: I have taken it at Kon-Kon, 14.v.; Izendelene

and Tafraout, 21.v.; Tagonits, 26.v.; Tzonbga, 30.v.; Tirourda, 17.vi.; Michelet, on a slope at back of our house, 22.vi.; Ait Bontchoune and Ait Ahamed, 24.vi.

I also took one specimen of *Melanargia galathea* at Michelet, on 22.vi.

5. *Pontia daplidice*.—Is another butterfly which flies in May-June, and I have even seen it in November on hot days.

6. *Dryas pandora*.—My first date for *pandora* is 26.vi. near Ait Bontchoune. We also saw it in the forest of Akfadou at Tala Kitan in August. It flies also around Michelet.

7. *Melitaea desfontainii*.—We were delighted to discover a little colony of this *Melitaea* on 30.vi. near a spot called Tzonbga on marshy ground at a considerable elevation in the Djurjura on the way to the famous Tirourda.

8. *Epinephele pasiphaë*.—On this day we also came across this species on steep rocky slopes in the same district. It flies on all the surrounding slopes I think, as we took it again at Tirourda on June 17th, a fine race, but difficult to capture as it flew in such precipitous places. This is the first time I have captured this species, and I was delighted to come across it. Thus little by little we are discovering many of the haunts of the insects around and, which probably up till now have remained secret.

9. *Tarucus theophrastes*.—Occurred locally in June and July.

10. *Scolitantides baton*.—We were pleased to find a colony of this species on the slopes at the back of our house in June.

11. *Lycaenopsis (Cyaniris) argiolus*.—Has been abundant this summer also *Glaucopsyche melanops* in the spring—particularly on lavender slopes.

I have not made mention of every species taken, but these notes are intended to be supplementary to the former lists published.

This year we have not had snow until January 10th, which is most unusual. All December we have had glorious sunshine, and on New Year's Day *Colias croceus (edusa)*, *Pyrameis cardui* and some "Whites" were still flying—also *Rumicia phlaeas*. All November and December we came across *Pararge aegeria*, *P. megera*, *Colias croceus*, *Rumicia phlaeas* and *Pyrameis atalanta*.

At present now we are enjoying a fall of snow, so I expect we shall not see any more butterflies until the end of February and March.—(Miss) L. M. Fison.

CURRENT NOTES AND SHORT NOTICES.

I am making an investigation into the extent to which butterflies in the perfect or imaginal state are preyed upon in the British Isles by birds, and should be grateful for any first-hand observations, giving, where possible, the species of both butterfly and bird, the date and locality, whether taken at rest or on the wing, how gripped (by wings or body), whether killed by being rubbed against an object, whether consumed by adult or young, whether the wings were swallowed, whether unsuccessful attempts at catching were noticed, and other details of interest. Wings detached by the bird are of value, both as evidence of identity, and also by reason of the imprint of the bird's beak which is sometimes shown.

Published records up to and including the year 1908 have been summarized in the admirable paper by Sir Guy Marshall, C.M.G., F.R.S., "Birds as Factor in the production of Mimetic Resemblance among Butterflies" (*Trans. Ent. Soc. Lond.*, 1909, pp. 329-383). I am making a search in both entomological and ornithological literature for British records published since this date, but as such are frequently not indexed and are easily missed, I should also be most grateful for any references which may be known to your readers, especially in the less well-known publications.

Communications can be sent to me c/o the Entomological Department, British Museum (Natural History), South Kensington, London, S.W.7.—C. L. COLLENETTE.

We have received the following personal separates of which we can speak with gratification. Dr. F. Heydemann of Kiel. (1) "A Contribution to our Knowledge of *Oporinia christyi*" with figs. of contrasted wing-markings, and a plate of structural details. (2) Two short supplements to his previously noted article on the *H. nictitans* group, with a plate. (3) A consideration of ssp. *scandinaviaria* of *Selidosema ericetaria*. (4) The Morphology and Variation in the Genus *Miana* (a) the *strigilis* Group. These pamphlets form a continuation to the author's series of useful investigations on tangled biological questions in the Lepidoptera.

Mr. J. S. Taylor, M.A., "The Cotton Insect and Disease Investigations" Pt. II. in S. Africa, dealing mainly with the American Bollworm (*Heliothis obsoleta*) and its parasites, particularly with *Microbracon brevicornis*.

Herr G. Warnecke of Kiel. (1) "The Distribution of *Valeria oleagina* in Central Europe," illustrated with a map showing that generally speaking it is concentrated on the higher level areas around the middle Rhine with a few outlying localities such as Budapest, Baltic Germany, Silesia. (2) "A new subspecies of *Papilio machaon* from S.W. Arabia." (3) "*Cosymbia (Ephyra) lennigiaria* in France."

Conte Emilio Turati. Our fear that Conte Turati had ceased to contribute to Italian entomology as expressed in the January number is, we are pleased to say, unfounded. Our change of address, some five or six years ago, was unnoted so that separates did not reach us. There now lie on our table some 15 separates covering the period, sent on to us by our kind correspondent for which we tender him our best thanks. (1) Three series of new forms of European Lepidoptera among them being ssp. *perlinaghia* of *Apatura iris*, form *silana* of *Zygaena meliloti*, ab. *minima* of *Z. loniceræ*, and ssp. *ragonoti* of *Salebria palumbella*, of the only species which occur in Britain. The confusion in Seitz over the group *Epinephele rhamnusia*, *E. lycaon* and *E. lupinus* is discussed. (2) An account of the Lepidoptera collected during five years in the Modenese Appenines, with two plates and text figures. (3) The account of an expedition in 1921-22 to Cirenaica, with six coloured plates containing 233 figures of new forms and species, and text figures. (4) Three separates describing and figuring further novelties obtained in Cirenaica, No. 1. with 1 plate and 34 text figures, No. 2. with one plate and text figures, No. 3. with a plate and text figures, etc. A really splendid output efficiently published with adequate illustration.

Dr. U. Rocci. (1) Observations on a specific Group of the *Melitææ*, dealing with *athalia*, *melathalia*, *helvetica*, *pseudathalia*, *britomartis*, *aurelia* and *dictynna* and their forms. (2) A continuance of the former

treating of *aurelia*, *britomartis* and *aureliaeformis* more particularly. An attempt to unravel the complex relationship of three closely related *Melitaea*.

Nomenclature.

Our good friend J. D. Gunder, F.E.S., of Pasadena, California, has sent us the following scheme of simplifying the nomenclature in a more scientific way than the present happy-go-lucky method of applying irrelevant names to odd forms as they turn up. The bulk of our aberrational forms come under "Transition Form," and would fall into the eight categories under it. To us the term "Variety" has had such a generalised meaning from all time, that it is better to let it drop out. "Subspecies" we think the better and is the prior, we believe; it agrees with the definition given. "Race" we would use for the colony, which contains a certain proportion only of a peculiar form, and not occurring in other colonies, *i.e.*, an incipient subspecies, or a subspecies in the making, just as a subspecies is a species in the making.—Hy.J.T.

SPECIES— SPECIES
A prime group of individuals reproducing their own in kind.

RACE—(Subspecies & "variety" being synonymous.) RACE
A digressing near-by group or a separate far-away group of individuals reproducing their own in kind which are constantly similar to, yet consistently atypical of, a predetermined group.

FORMS { **LOCAL FORM**— F. LOC.
A cognate form whose congenial habitat or metropolis is considered restricted to segregated localities within the range of a species or race and generally contiguous to them; *i. e.* altitude or confined desert forms.
FORM—(or general form) F
A form occurring quite generally and commonly throughout the range of a species or race. This term is much abused, new names being given on slight differences usually "representing ordinary variance or usual variance occurring within the range of a typical series and understood by the original author."
SEASONAL FORM— F. VERN. or F. AEST.
Forms occurring within a species or race only at certain periods of the year.
SEXUAL FORMS— ♂ F. & ♀ F.
Forms belonging to one sex only.

Deviating, cognate individuals or group of individuals, bred continually or at cyclic periods within a species or within a race, and which are, at a rule, practically counterparts of one another.

TRANSITION FORM— TR. F.
Recurrent individuals within a species or within a race which by change of color or by change of pattern graduate with persistent characteristic similarity from parental type to definitely limited variation away from parental type. These may be classified for name retention as follows:

Change of color— { melanism—to black
chromatism—to follow color sequence
albinism—to white
pellucidism—lacking color, or to iridescence
Change of pattern— { immaculism—lacking design
albifusism—white design radiation
chromatofusism—color design radiation
melanifusism—black design radiation

HYBRID— HYBRID
Progeny which have the combined essential characteristics of parents each unlike in specific character relation.

UNNAMABLE or SYNONYMOUS FORMS— SYNONYM
Hermaphrodites, mosaics, dwarfs and giants, rubbed specimens, chrysalis burns, pigmental fluid misplacements, venation malformations, wing shape distortions with resulting pattern changes, scaleless, monstrosities, degreasing or killing color changes, fades, inverted wings, parasitic wing punctures and all so-called freaks, aberrations, mutants, illforms, malforms, deforms and sports.

Names given to specimens which vary from normal in an abnormal way due to the above listed lepidopterist inflictions fall into the synonymy and have no classification rating by rank in check lists or catalogues.

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EXCHANGES.

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Duplicates.—*S. Andrenaeformis*, Bred 1928, well set on black pins, with data.

Desiderata.—Very numerous British Macro Lepidoptera.—*J. W. Woolhouse, Hill House, Frances Street, Chesham, Bucks.*

Desiderata.—Species of Dolerine and Nematine sawflies not in my collection; list sent.—*R. C. L. Perkins, 4, Thurlestone Road, Newton Abbot.*

Duplicates.—*Albimacula**, *sparganii**.

Desiderata.—Ova of *D.oo* pupae of *X. gilvago*, *D. caesia*. *A. J. Wightman, "Aurago," Bromfields, Pulborough, Sussex.*

EXCHANGES.—Living Eggs of *Catocala fraxini* and *sponsa*, exchange for butterflies of British Isles.—*C. Zacher, Erfurt, Weimar, Street 13, Germany.*

Duplicates.—*Pyrulina**, *Salicis*, *Ianthina**, *Orbicularia**, *Repandata* in variety, *Doubledayaria*, *Black rhomboidaria**, *Black virgularia** and others.

Desiderata.—*Hyale*, *Welsh aurinia*, *Polychloros*, *Tiphon Agathina*, *Lunigera*, *Lucerneae*, *Neglecta*, *Diffinis*, *Populeti*, *Gothica v. gothicina*, *White Leporina*, *Tridens Putrescens*, *Littoralis*, *Typhae v. fraterna*, *Rurea v. Combusta*, *Gilvago*, *Fulvago v. flavescens*, *Liturata v. nigrofulvata*. *Harold B. Williams, Woodcote, 36, Manorgate Road, Kingston Surrey.*

Duplicates.—A large number of species of European and Palaearctic Rhopalocera and Heterocera.

Desiderata.—All British species especially those illustrating characteristics of an island fauna. *Dr. Lor. Kolb, München 54, Dachauer-str. 409, Germany, and Franz Daniel, München, Bayer-str. 77, Germany.*

Desiderata.—Living larvae or pupae of *Lasiocampa quercus*. Also set specimens of same species taken before 1910 in Devon or Cornwall.

Duplicates.—*Pavonia*, set specimens or living stock: *Monacha*, ova: *ochroleuca*, *griseola*, *advenaria*, *juniperata*, *thetis*, etc.—*J. A. Downes, 5, Trinity Road, Wimbledon.*

URGENT.—Wanted English (Cumberland) *Erebia epiphron*. Adequate exchange will be made in European Lepidoptera.—*B. C. S. Warren, 14, Avenue de l'Eglise Anglaise, Lausanne, Switzerland.*

I am seeking an opportunity of exchanging Macro- and Micro-Lepidoptera with English collectors and beg to send list of duplicates.—*J. Soffner, Trautenau (Bezirksbehörde), Bohemia, Tschechoslowakische Republik.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. April 5th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. March 23rd, April 11th, 25th.—*Hon. Secretary, S. N. A. Jacobs, "Ditchling," Hayes Lane, Bromley, Kent.*

The London Natural History Society.—Meetings first four Tuesdays in the month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through Members, or from the Hon. Sec. A. B. Hornblower, 91, Queen's Road, Buckhurst Hill, Essex.

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Entomologist's Record.

Photo: G. Larkin.

1. Female Pupa of *Psyche constancella*.
2. Female Generative Organs of *Lepidoptera*.

Notes on the Psychides. XV. (With Plate III.)

By Rev. C. R. N. BURROWS, F.E.S.

In continuation of my remarks in my last paper on this subject, I am now able supply, in Figure 1, on the accompanying Plate, a photograph of one of the very curious, hard, dark, red ended, pupae, to which I called attention, and denominated Section A.

This is the pupa (or puparium) of *Psyche constancella*, Brd. The specimen itself comes from Dr. Chapman's store, and is numbered 895 in the general collection of *Psychides* now in my charge.

The object being so opaque, and rugose, seemed to present some difficulties in reproduction; I sent it therefore to my good friend and helper, Mr. G. Larkin, of Newark-on-Trent, to do his best with. The result is reproduced here. It was taken by the agency of infra-red-light, and certainly appears to show details better than would an ordinary photograph. The soldered segments show very clearly, as also do the spiracular scars. The unbroken head portion, on the right hand, indicates that the female is still within, and the anal extremity also remains intact.

Mr. Pierce's examination of Dr. Jones' specimens mentioned before, has not revealed any corresponding formation amongst the American material, and I understand from himself, that Dr. Jones, with all his careful examination, has not met with such. This fact seems to prove that, so far as our present knowledge goes, the New World, we must suppose, has, with the exception of one or two *Solenobiae*, no representatives of the *Psychides* parallel with those of the Old, until we reach the extreme end of our list. This means that two thirds of our Genera are not represented there. There is no lack of qualified collectors and students, in America who must have found them, did they occur. This may indicate that the Palaearctic races have been blocked by Bering Straits, from the Neo-Arctic world.

The second, and larger figure on the Plate, I am using for two purposes, first, as a dissection of the usual females, in Lepidoptera, and secondly to try to explain the particular specimen represented.

[NOTE.—This is copied from a reprint of a Paper by N. J. Kusnezov, entitled "On the probable viviparity in some Danaid, *i.e.*, Pierid, Butterflies," published in Leningrad, 1931. It represents *Colias aurorina*, H.-S.]

The complete Plate exhibits dissections of three specimens of the genus *Colias*. I have selected one of these as it appears to exhibit best the points to which I refer.

I am noticing only certain organs, neglecting the other subsidiary parts, as I do not propose to treat of them. These appear to have to do with the varnishing, oiling, and possibly colouring, of the ova.

Fertilization amongst Lepidoptera in general, is well known to be effected for each ovum individually, as it passes down the Oviduct to be deposited. It would appear probable that only one ovum is actually alive in the oviduct at one time. The sperm is received and stored, in the Bursa copulatrix of the female, and supplied by the mother to each ovum as it is being extruded. It will be understood that each

has to pass this critical point, there to receive the necessary charge. The female can store this for use, and discharge it as required.

This action has to be combined with the further business of bringing each into position, in order that no sperm be wasted, and each receive the necessary share. Unless the insect has "paired" the ova though laid, very generally prove to be infertile, and I imagine that the female sometimes misses, with the result that we may find some infertile ova amongst the fertile.

[NOTE.—It is also certain that the female can, and does, store this sperm, for in the cases where the male dies off before the the winter, while the female survives, we find her able to lay fertile ova, in the Spring. This occurs also with Wasps, and doubtless with many other creatures. I have myself confirmed this arrangement of parts in *Noctuidae*, and Petersen, in his treatise on *Eupithecia* (1909) provides a very clear diagram for that section of the *Geometridae*.]

There is no reason to doubt that things are much the same with the *Psychides*, but owing to the small size of our easily collected species, and the extreme delicacy of their structure, it is very difficult to identify the organs, while with the larger ones much the same trouble is experienced. For this reason it is impossible to speak with certainty about their anatomy.

Turning again to the Plate Figure 2. We observe at once the larva enclosed within the much inflated oviduct. It will strike us at once how extraordinarily large it is, as it lies doubled up just below the point of fertilization.

[NOTE.—As I have not myself any knowledge of the normal formation of the interior female organs in *Colias*, I have no right to criticise; I only remark that this seems to me to be very much larger than necessary for the passage of a single ovum.]

It would appear that the location at this exact spot, of even a newly hatched larva, would lead us to infer that the whole process of hatching had taken place there, since the ovum had not been able to travel further along the oviduct. Indeed, unless this period had been very much reduced, it would incur a total stoppage of the process of reproduction, and reduce to a minimum the natural functions of the mother. Had the not unusual period of two or three weeks been required for this, the natural active life of most insects would scarcely allow her to perpetuate her species. It appears therefore that there must be some other explanation than viviparity, for this strange complication.

So soon as I encountered the suggestion I naturally turned to my own mounts to see if I had any which would bear out the suggestion. I then discovered, in the bodies of several females of the genus *Colias*, just ONE larva apiece, and these in the exact position occupied in the Plate. In these however although the hard heads were quite evident the bodies were somewhat indistinct, as though not fully developed. This might indicate only the effect of the caustic potash used in preparation, or that the bodies died before being completely hardened. I found exactly the same fact in the genus *Argynnis*, and I thought in *Pieris*, though I have not been able lately to identify that particular mount. My best find was a female of *Parnassius apollo*. This

exhibited a very fully developed larva within the oviduct, and with its head close to the exit into the ovipositor. This appeared to afford a clue. This Alpine Butterfly, I am told, lays its ova in the Autumn, and that these hatch in the spring, several months later. This example had been killed, set, dried, and reduced to the status of a cabinet specimen, when it came into my possession. She had evidently been flitting about on her business of oviposition. One ovum was on the point of being deposited, when she was captured and killed. The ovum was not affected by poison, or whatever method was employed to kill the mother, or indeed by her death. In due course that one egg hatched. The very large size of the resulting larva suggests, as does the plate before us, a certain amount of growth and of movement. A photograph of this mount will be provided with Paper XVI. Upon what did these larvae feed, that while imprisoned in the body of the mother they could grow? I can only surmise they fed upon their parent's body, which might retain a certain measure of moisture or of soft fat. I can indeed in no other way account for the fact that these enclosed larvae are obviously much larger than starved ones could be.

It has been suggested to me that this apparent viviparity, found so far only in mountain species, may indicate a provision of Nature to enable the species to survive a severe Winter. To my mind it is however impossible to imagine such a sudden catastrophic fall in temperature as would prevent the egg-laying butterfly completing her business. I do not think the species in question have any hibernating tendencies, and I suppose that so extreme a fall would in many cases destroy all larvae except perhaps such as remain unhatched.

Some years ago I took, in the Spring, a female of *M. atropos*. I boxed her, and provided some sweet food. She was greatly exhausted, and past feeding, and survived only a day or two, if so long. After her death, I found that she had laid just ONE egg. This duly hatched and the larva fed well until it escaped. I took from this individual's body just 200 fully developed ova, while the ovaries were stocked with a further supply, in graduated stages of development. None of these eggs, removed after the mother's death showed a sign of fertilization. I consider these instances are sufficient proof of individual fertilization of the ova.

DESCRIPTION OF PLATE III.

- Fig. 1. The rugose pupa of *Psyche constancella*.
 Fig. 2. Diagram of the internal organs of female Lepidoptera.
 bc—Bursa copulatrix. ds—ductus seminalis.
 ld—Signum. ov—Oviduct—ovaries not figured.
 db—Ductus bursae. ut—Distended oviduct.
 a—Normal oviduct. b—Ostium (hidden by skin).

The cross marks the point of fertilization.

Cornish Notes for 1932.

By CHARLES NICHOLSON.

(Concluded from page 42.)

Plusia chrysis was another visitor to the net-window, and speaking of the bats reminds me that one morning I found the forewings of *Agrotis suffusa* beneath the window. Now as regards the butterflies, the three "whites" were exceptionally abundant in their second brood and *P. brassicae* was particularly so. It seemed very partial to the flowers of *Buddleia variabilis*, on which it was quite common to see it in company with *Vanessa io* and *Pyrameis atalanta*, both of which were also common this year. It was very noticeable that *io* was in the majority in the first half of August and *atalanta* during the rest of the month, when *io* became much scarcer, probably due to its retiring into winter quarters as the weather cooled down. *Aglais urticae* was common this year on the *Buddleia* and I made a point of tearing off the apex of one forewing of each specimen I saw at first so that I could check the numbers in view of the rarity of this species hereabouts of late years. I must have seen some 30 specimens altogether in the garden and only one of these was one of my marked specimens. Its last appearance was on September 18th in company with *atalanta*, a belated *io*, and *Pararge aegeria*, on flowers of *Sedum spectabile*; on the same day a specimen of *Colias croceus* var. *helice* crossed the garden within a yard of where I was standing and I have seen specimens of the typical form in this district on May 16th, July 7th, August 28th and 31st respectively; but a friend at Perranporth tells me he must have seen about 40 on the sand dunes there during the week July 7th-16th, and others round about August 10th. *Pararge aegeria* and *P. megera* have been about as common as usual, but I have not been so struck before with the local abundance of *P. aegeria* as I have this season. In one lane there was one every two or three yards, whilst in another near, and to all appearance equally suitable, I did not see one. *Gonepteryx rhamni* is by no means common here, and although I have seen odd specimens from time to time in the garden and elsewhere I have previously found only one buckthorn bush and that a poor one in a marsh about 4 miles away as the crow flies. Last year, however, I discovered three good bushes of Alder Buckthorn—the Common Buckthorn has not yet been recorded for Cornwall—in a marshy valley within a mile and a half of my house and I have no doubt there are others, but I have not so far found any in the vicinity although I have been on the look-out in likely and unlikely spots. I have seen a few small bushes in the roadside hedges beyond Ladock village, but that is near the bush in the marsh and could scarcely account for our local specimens. In the spring the male butterfly was seen in the garden on April 22nd, May 3rd and 28th and probably it was the same hibernated specimen in every case. I have records for August 21st, 22nd, and September 14th, again probably the same male in each case, but my wife saw a female in the garden on September 16th. There is plenty of holly about, and thick ivy on the trees, for hibernation, and I have 2 plants of each species of buckthorn grown from seed in the garden, so I hope to see the butterfly more commonly in future! It visited the *Buddleia* flowers this year, but its favourite

flower here is Red Campion and I have never seen it on Wood Betony (which it is so partial to in the New Forest) although that is common everywhere hereabouts. One *Pyrameis cardui* visited the *Buddleia* flowers on August 12th, 16th, 25th, and 26th and that is the only example of this species that I have seen since 1931. I was surprised to see a male *Dryas paphia* at the flowers on August 19th and the same specimen with half of the right hindwing missing on the 22nd. I did not see him again, but a female in good condition appeared instead on the 24th. One *Rumicia* (*Heodes*) *phlaeas* also visited the flowers, but this species is a rarity in this neighbourhood in spite of the very unwelcome prevalence of docks and sorrels. In 1931 a male *Hipparchia semele* frequented the *Buddleia* flowers for a day or two, and I am rather at a loss to know where it could have come from, unless it was introduced with roots of heather from a moor the other side of Truro, where it is certainly common. This year curiously enough a female has haunted the garden for a day or two and was seen on the *Buddleia* flowers on August 25th. The only *Enodia hyperantus* (a scarce species about here) that I saw was put out of the verandah on August 6th. *Brenthis seleno* was common on boggy ground near Callestick on June 26th, and still in fair condition at Land's End on July 7th.

From what I have said it seems probable that most of the British butterflies are attracted by *Buddleia* and I am hoping next season to see *Polygonia c-album* and possibly *Euvanessa antiopa* in the garden! I am surprised that the former has not been met with hereabouts yet. On August 28th *Pieris rapae* and *P. napi* were plentiful in about equal numbers on a patch of fleabane (*Pulicaria*) flowering profusely in the marshy corner of an upland meadow.

As regards "other orders" I have very little of interest to record. After the outbreak of *Strangalia aurulenta* in the garden in 1931 it is rather surprising that only one specimen of this interesting beetle was seen in 1932, and that was flying in the hot sun on June 23rd, an earlier date than the 1932 records, due probably to the hot dry weather we had in that month. I believe there is a certain amount of periodicity in the appearance of some at least of these big longicorns and it may be that the old stumps in the garden came to maturity so far as *aurulenta* is concerned in 1931 and that nothing more will be seen of it. Certain it is at any rate that all the old stumps in the garden suffered from a dreadful attack of the Honey Fungus (*Armillaria mellea*) the emanations of ammonia from which made the garden smell like one huge urinal when the fungi were decaying! Such an attack is usually the beginning of the end of an old stump!

Hitherto I have seen only females of *Andrena fulva* in the garden, but 1932 saw the males quite common, resting on stones in the sun in April, and accompanied by a few *Andrena cineraria*, which I have not seen here before.

On September 16th my wife picked up a dead, but perfect, female *Cordulegaster annulatus* on the road, the only dragonfly I have seen killed by motor-traffic; in fact insects seem very rarely victimised in this way, except humble-bees which suffer fairly frequently, and I have seen an odd butterfly or two.

The only other find worthy of note is a living green cockroach (*Panchlora* sp.) found in my shopping bag on April 16th and probably an escape from bananas.

A remarkable find in the verandah in August last was the head, thorax and forewings of what was obviously *Gnophos obscurata*, quite hard and dry and too wasted to say with certainty what form it belonged to, but it was very pale buff with the spot and lines dark brown. Nothing of this species has been seen hereabouts either before or since and I can only think that it may have come in as a larva with my heath plants.

Noctuae in 1932.

By A. J. WIGHTMAN.

I think the spring of 1932 must have been as bad if not worse than any within living memory as regards collecting at the willows, black-thorn bloom, etc. I certainly have never before experienced such unsuitable collecting conditions and found so few insects after hard and frequent working; many species usually abundant here were quite rare, and on no occasion did I find more than a score of insects on a single evening on ground where, in most years, hundreds of moths can be examined in an hour or so; nor was this scarcity of insects due to their being hard to find as a result of the weather conditions being unsuitable for willows, etc., to be attractive, for later in the year the larvae were equally scarce. The bad start was followed by a wet period which, with a few small breaks, continued till the end of July when it was especially wet and as a result when the weather did improve and become settled the extreme dampness of the ground, in all but exposed positions, caused fogs and mist to appear as soon as the sun was down, and the herbage half an hour after dark was covered with such a heavy moisture, that conditions were such as exist after rain. By September, however, conditions had improved and the species, which are usually associated with ivy bloom and yewberries, appeared to be almost up to normal in numbers.

For reasons not entirely connected with the weather I decided to give such time as I had to spare for Entomology, to an examination of the immediate neighbourhood of Pulborough instead of making frequent excursions further afield, and as so often happens I found a number of species at my very door, which I had previously supposed it necessary to travel to a distance for. Among others I found *Ruralis betulae* to be well spread all around this district, yet no where really plentiful, I also found that *Strymon w-album* is a Pulborough District species. At the time the Victoria History of Sussex list was prepared, it was questioned whether the butterfly was still to be found in the county. *Polygonia c-album* has a firm hold here now; until about three years ago I had never seen its larva, but this year when beating nettle, I beat the larva in many places and also noted the perfect insect on a number of occasions.

Caradrina ambigua.—I bred a batch of *C. ambigua* from Devon ova and was surprised to find that the larva of this species has a taste for dead pupae, when they were approaching full growth early in December, 1931. I fancied I could see a remarkable likeness in these larvae to those of *Senta maritima*, both in appearance and behaviour, and remembering that *maritima* larvae thrive on dead pupae, I put a few dead pupae of *P. arundinis* in the box. Next day I found the larvae

had deserted the dock leaves given and had eaten out the *arundinis* pupae, leaving only the harder parts of the case. I gave more dead pupae and, after leaving the box closed and in darkness for an hour, made an inspection. All the *ambigua* larvae were engaged in feeding on the dead pupae, eating round holes through the pupa case and devouring the contents, which in point of fact were dead moths as these pupae died just at emergence point through being kept too dry.

This pabulum, remarkable as it seemed to me, proved satisfactory and I bred the moths in January this year.

Agrotis ripae.—A further batch of Sussex *ripae* bred this year (1932) confirms last years experience, that while the ground colour varies from clear white to ochreous brown and the markings from ashy grey to deep ochreous brown and slate grey all these Sussex examples belong to pale costa forms; the difference in appearance between the white almost unmarked forms and the heavily marked forms with high colour ground is as great as in any species I know for forms from the same spot and it is evident this species is one of the most variable in the group.

Agrotis saucia.—From a large batch of ova received in Oct. 1931, from Mr. P. P. Milman, rather more than eight hundred larvae emerged and were fed up on groundsel. Kept in a warm room they progressed rapidly and by end of November I had over 700 fullfed larvae. Of these I turned out all the smaller and less healthy individuals, and the remainder (some 500) pupated successfully and emerged during January this year.

The imagines are all dark in colour, belonging to the forms *saucia*, Hb., *nigrocosta*, Tutt. and a very dark form which is probably the *majuscula*, Haw. There are also a few specimens of a form I do not find mentioned in any work I have although I previously possessed a single example which came from the Isle of Man. This form has the central fascia much darker than the rest of the wing and so copies the allied species *suffusa* in which this dark band is usual. I had rather expected that in so large a number, examples of all or nearly all the common forms of the species would have occurred, but probably heredity determines the forms produced from any given pairing; I doubt uniformity of treatment having had much to do with the somewhat uniform result.

A. vestigialis.—While collecting forms of *A. tritici* from the heather (*Erica cinerea*) on a sandy common at Pulborough in August, I captured a moth which when on the wing and hovering at the bloom I was unable to place. It appeared to be black with whitish sided thorax, the contrast being great enough to be distinctly noted in the late twilight. This proved to be an almost black example of *vestigialis*, and the first example of that species I have taken here.

Large ♀. The forewings are purplish black with the characteristic markings of the species distinctly discernable. The oval mark near the base being blackish red instead of the more usual yellow; hindwings black with purplish sheen, thorax black but with pale grey lappels. It is a very much darker insect than any I have ever taken on the Hants Coast, and when placed among the darkest ♀♀ I have from other localities, it is seen to be quite a different form, altogether blacker. Tutt, *Brit. Noc. and Vars.* Vol. II. page 19, describes a form of *vestigialis* as ab. *nigra*, but it is obvious from the description he

gives that his name applies to a much less extreme form than this Pulborough insect, which agrees fairly well with the example mentioned by South, *Brit. Moths*, page 202 as taken by Mr. Jäger in North Wales.

I continued to work this spot for 10 days but without being able to find another specimen of the species. Weather was foggy and unsuitable for sugar, light, or any other method of collecting, so I am unable to say whether this is a chance ab. or our local form.

(To be continued.)

The Geographical and Seasonal Variations of *Argynnis (Issoria) lathonia*, L.

By ROGER VERITY, M.D.

Since erecting the name of *florens* in the *Ent. Rec.*, XXVIII, p. 130 (1916) and that of *emiflorens* in Vol. XXXI, p. 195 (1919) for the larger and the lesser forms of *lathonia* in its race of Peninsular Italy, I have been collecting the species from every possible region, to find out what races existed and what their distribution was. The conclusion I have come to is that there are very few and that they are not as definite as those of most other *Argynnidi*.

One can safely say that the most striking and handsome ones are the Italian *florens*, which is the largest and most gaudy form of the species and usually has a very reduced black pattern, and *emiflorens*, which is more normal in size and pattern, but of the same rich and bright fulvous; according to localities and to seasons, one or the other prevails, more or less, in the same way, from Emilia, Liguria and Tuscany to Sicily. The length of the forewing, from the root of the costa to the apex, where the fringes end, is, in *florens*, 24 to 25mm., in the male, and 25 to 26, in the female, against 21 to 23 and 24 to 25 or less, in *emiflorens*, in exceptionally small individuals.

In my original description of the latter (*l.c.*) I mention my series of specimens from the Baths of Lucca, in Tuscany, as characteristic of it and, when I wrote, I selected a couple from there as typical of *emiflorens*. I made the mistake, however, of stating that the summer form of Central Europe is similar to it. It is, so far as size and extent of black pattern are concerned, but the tone of fulvous, I have spoken of above, distinguishes *emiflorens* from it and unites it to *florens*, so that this natural geographical group must be kept separate, not to create confusion.

This actually leaves the summer generation, or, perhaps, the two summer generations in certain localities and years, of Central Europe without a name to designate them, incredible as it may be, considering their constantly more or less different aspect from that of the first, spring, generation. The latter must be taken to be nominotypical *lathonia*, as *Fauna suecica* is the first quotation in Linnaeus's original description and Upsala is given there as locality for the species; August specimens from Norrviken, in Central Sweden, I possess, are identical with the first generation of the rest of Europe, only one generation presumably existing there. The specific name must thus be restricted to the spring one, distinguished chiefly by its small size, by the very broad and sharply outlined patch of deep greenish-black scaling at the

base of the wings and along the hindmargin of the forewings, by the pronounced black pattern in general and by the dark chestnut colour which fills all the spaces between the silver spots on the underside, right down to the base of the wing.

In the summer form of the southern portion of Central Europe the size is larger, the fulvous is usually brighter, the black markings are reduced to a very variable degree, which culminates in the total absence of the basal suffusion on the forewing and in a very great reduction and paleness of it on the hindwing of the male and in a very small spotting, including the partial obliteration of the premarginal streak on the forewing (these extreme upperside features are well represented in Lang's Pl. XLIX of the *Butt. of Europe*), and finally, the chestnut patches on the underside are of a light, bright tone and so reduced that they leave the straw-yellow ground-colour uncovered to a great extent between the silver spots. I name the more highly characteristic form **nigroprivata**, n. nov., selecting as cotypes a series of August specimens from Saint Côme Bazas, in the Gironde; I have similar ones, slightly larger and brighter, from Geneva (Bois Taille and Versoix, end of August) and I have collected some still larger and more brightly coloured ones, evidently transitional to *florens*, on August 8th, at Ponzone, in Southern Piedmont. Also within the zone of *emiflorens* and *florens*, *lathonia* exhibits the *nigroprivata* facies, quite racially or mixed with a few *postlathonia*, in the very exceptionally alpine-like surroundings of the largest mountain masses of Central Italy, where even some Central European and Alpine species, such as *Melitaea parthenoides*, Kef.=*parthenie*, auct., and *Coenonympha tiphon*, and corresponding exerges of others, have survived in a few isolated colonies, presumably since they spread there during the Glacial Periods. Thus, I possess a large series of *nigroprivata* from Bolognola, 1200m., in the Sibillini Mts. (Piceno). My collection contains specimens of *nigroprivata*, which are quite similar to the palest ones of Central Europe, from Margelan, in Turkestan. The *nigroprivata* form is, however, comparatively local and proper to the driest localities and to July and August, even within the zone it inhabits. It will thus be necessary to have also the name of **postlathonia**, n. nov., to designate the more broadspread Central European and the late season form, which exhibits characters intermediate between it and the spring generation in that the fulvous is duller and paler than in the former, in that the basal suffusion is present, but lighter, more greenish and less sharply outlined than in the spring one and in that the, underside, chestnut patches are intermediate in extent and in tone. It corresponds to the Italian *emiflorens*, from which it differs by the slightly more pronounced black pattern and chiefly by the very much paler and duller colouring of both surfaces. I select, as holotype a male specimen from Hilversum, in Holland, of July 21st, and others I have are from Canterbury, in England (collected by Cook in 1856), from Cassel, in Germany, from Orléans, from Chantonay, in Vendée, all clearly belonging to the same, small and pale race; if there ever is a second generation at Upsala, it, no doubt, is of this sort too: length of forewing 20 to 22mm. in the male, and 22 to 24 in the female. I possess it also from Tomsk, in Siberia, where it has a very pale tone of fulvous.

In the damp valleys of the Alps a much finer form is produced, of larger average size (22 to 24 in the male and 24 to 25 in the female),

of a richer colouring, whether the fulvous be brighter or duller, according to individual variations, and characterised particularly by a prominent black spotting and by a basal suffusion nearly as sharp as in the first generation, although it is of a lighter tone and it has, especially in the female, a remarkably green, silvery, sheen. In the Anzasca Valley, at the foot of Mt. Rosa, *lathonia* swarms at Vanzone, 600 to 700m., in numbers I have not seen equalled anywhere else, during the second half of July and at the beginning of August, and it belongs to this form, not a single *nigroprivata* occurring amongst them: a series of these specimens will serve as cotypes of this form and race, which I call **magisnigrata**, n. nov. It is noteworthy that, at the beginning of September, a scanty third generation makes its appearance at Vanzone and is perfectly identical with *emiflorens* of Tuscany, owing to the fact it is of a much richer, warmer and brighter fulvous than the preceding and the black spotting is thinner in both sexes.

On the northern watershed of the same chain of mountains and precisely in the Valais and the Vaud, I have found a similar form to *magisnigrata* in the damp meadows, whilst in the drier spots I found *postlathonia*, but, curiously enough, no *nigroprivata*; the species, however, was very scarce.

I notice that forms, practically equivalent to *magisnigrata*, by the extent of the black spotting and of the basal suffusion, constitute the IIIrd. generation, collected from September 20th to October 4th at St. Côme, in the Gironde, where the IInd. generation consists, as aforesaid, of *nigroprivata*, and that the same thing takes place, at the beginning of October, in the Serra da Estrela, 1000m., in Portugal, where the IInd. generation belongs to *attenuata* and also the IIIrd. exhibits, to a high degree, this feature, in conjunction with the *magisnigrata* pattern: **nigriorattenuata**, n. nov. Sagarra has given the name of *attenuata* to the two summer generations of S. Pere de Vilamajor, near Barcelona, describing them as similar to *emiflorens* of Tuscany, but with none of the brightness of this race, owing to a very thin veiling of grey scales, which extends over the fulvous ones and thus gives them a very dull and dirty look. If one examines the scales microscopically one finds no such veil exists, but that some of those, which contain the fulvous pigment have a discoloured, grey aspect, probably due to their being partially empty and reflecting the light. It seems to me this *attenuata* look is much more racial in Spain, in Africa and in Asia Minor than elsewhere, but that it is not peculiar to these regions, only being totally absent in the *emiflorens* and *florens* of Italy, but occurring not infrequently in some individuals of the Northern exerge. In the Asiatic *issaea*, Gray, is quite a constant characteristic, and, in conjunction with the large size of its black spots and of their uniform development all over the wings, it gives it a peculiar sombre aspect.

At Bex, in the Vaud, I have found, in damp meadows, from July 28th to August 3rd, a form which recalls the general facies of *issaea* very much by uniting those features too and which is thus the darkest form of *lathonia* I know of from Europe. I think the name of **maximemaculosa** will be found useful to designate this culminating grade in the development of the black pattern.

In all the other localities of the Alps, where I have collected *lathonia*, I have found the usual form is *postlathonia*, including the

particularly dry and warm valleys of the Upper Adige, with individuals transitional to *magisnigrata* in some cases or to *nigroprivata* in others. So far for the races of Northern and Central Europe and Siberia.

As to the South, the perfectly constant and very striking difference between the races of this species in Italy, on the one hand, and those in Asia Minor, Africa and the Iberic Peninsula on the other, can scarcely be accounted for by the direct influence of different conditions in those regions and suggests a difference in their constitution or, in other words, two exerges. This conclusion is sustained by the fact that they respectively inhabit areas corresponding to those of the Central and of the Southern exerges of many other species. The I. generation of Italy does not differ from nominotypical *lathonia*, but we have seen *emiflorens* of the II. and III. is characterised by its more vivid colouring, and *florens* also by its larger size, than any other race. Now, this corresponds, in broad lines, to races *appenninica*, Vrtý., and *lavanda*, Frhst., of the Central exerge of *A. niobe*, which spreads as far as the S.-E. of France, the latter being the largest and most vividly coloured race, and resembling *orientalis*, Alph., of the Tian-shan to a surprising extent.

On the contrary, all the fragmentary information one finds about *lathonia* in Asia Minor, in Africa and in the Iberic Peninsular is to the effect that the fulvous is paler even than in that of Central Europe, the pattern is often darker and the size usually smaller and my materials agree with these statements both as regards the spring and the summer generations. Röber described the race of the Taurus in 1896, under the name of *saturata*, as transitional to *issaea* and having a pale upperside and the underside ground-colour covered by reddish brown, between the silver spots of both fore- and hindwing. My specimens of the first generation, collected at Ak-Sbehir, in Anatolia, in May, have in fact, a peculiar look, never seen even individually in Central Europe nor in Italy and more like that of a very tiny *issaea*, by its heavy markings. Ribbe says all his *lathonia* from Andalusia are certainly *saturata* too and it is to be presumed he speaks of the first generation and perhaps also of the late autumn one, as none of my specimens of the summer generation from the regions mentioned above answer the description of *saturata* in the least. They are either identical with the *postlathonia* and with the *nigroprivata* of Central Europe, on both surfaces, or more usually, their upperside exhibits the particularly dull and dirty look, described by Sagarra, so that his name of *attenuata*, given explicitly to the summer generations, is the right one to use for them.

The I. gen. *saturata* and the II., or the II. and III., which consist entirely or partially of the form *attenuata* and *nigriorattenuata*, thus seem to constitute the Southern exerge of *lathonia*, which, presumably derived from *issaea* of the Himalaya and Western China at the same time as *Pieris manni* derived from *canidia*, *Colias croceus* from *fieldii*, *Gonepteryx cleobule* and *cleopatra* from *amintha*, etc., during the first western migration, as far as the Canaries, in the still subtropical early Miocene days, so that it is one of the species which has survived till now in those islands. Its absence from the Pacific zone might sustain the hypothesis that it is derived from a tropical ancestor in southern Central Asia, unless it got there already under the form of *issaea*, together with *Parnassius himalayensis*, Elwes, and other species, which

are supposed to have come from the Polar Continent at the end of the Cretaceous.

Reuss has lately found the genitalia of *issaea* are different from those of *lathonia* and concludes they are two species. As I have stated in the *Iris*, 1932, with regard to the splitting of *B. pales*, Schiff., I consider it a mistake to extend the term of "species" to relationships of this sort and proofs of sterility should be required before using it; we should not do like the ornithologists, who consider the Mongolian and the European pheasants two species, but we should keep to the standard of the anthropologists, who do not consider the Mongolian and the Caucasian human races as species. Anyhow, whatever the origin of *issaea* and its relationship to *lathonia*, which I consider, for the present, as exergic, are, the aforesaid distribution of the latter to the west of Central Asia only and the very slight difference indeed between its southern and its northern group of races, which scarcely could be exergic, seem to suggest that the Northern ones have simply come into a very recent existence through the spreading of the Southern ones in that direction, after the Glacial Periods were over, from Central Asia to Siberia, and thence, around the Caspian sea, by the newly formed isthmus, into Russia.

What may be a really distinct exerge, owing to its much more ancient Miocenic origin, during or after the earliest westward flows of migration, are the races of Peninsular Italy, which have acquired the remarkable developments in size and colour no other region exhibits, even individually, except, probably, the Balkans, but whence I have no specimens to compare with them, save a couple labelled "Turkey," which resembles *florens* considerably. If *emiflorens* and *florens* do constitute a Central exerge, the races of the Baths of Valdieri, in the Maritime Alps, and other Piedmontese localities, I have described as transitional, would be synexerges, produced by crossings with a northern strain, such as many species exhibit in the Western Alps, and amongst them, *B. pales*, whose Northern exerge *pales*, and Central one *graeca* meet there, as discovered by Higgins. In the particularly dry and hot locality of Oulx in the Cottian Alps, at 1100m., I have found what is, apparently, a pure race of the Central exerge, as it consists entirely of *emiflorens*, exactly like the Tuscan ones, and some unusually large individuals, similar to the less extreme *florens*. It is the only race of this sort I have before me from a locality outside Peninsular Italy, but I believe similar ones have spread, beyond the Alps, into the S.E. of France, as in the case of other *Argynni* and of many butterflies, if I remember right, from specimens of *lathonia* I have seen from there.

The Origin of Castes in Insects.

By E. A. COCKAYNE, A.M., D.M., F.E.S.

Light is thrown on the possible origin of castes in insects by the giant mutation of *Drosophila melanogaster* described in a long paper in English by C. B. Bridges and E. Gabritschewsky (*Zeitschr. f. indukt. Abstamm. u. Vererbungslehre*, 1928, 46. 231). The mutation first appeared in triploid females, constituted XXY, and the gene was found to be in one of the attached X-chromosomes. In consequence of this chromosome aberration the gene was only present in females and was

transmitted to all the female, but to none of the male offspring, of such females. The flies with the gene were either of normal size or giants, 70 per cent. bigger in bulk, but were never intermediate in size. It was found that the development into giants was dependent on an abundance of food at a critical stage of larval growth, and that the larvae, which produced giants, continued to feed for some days longer than the others. Both small and giant flies were fertile.

The author says, "the situation of a single genotype with two phenotypes sharply differentiated in size, depending on the amount of nutrition before a critical point, is parallel to the castes of bees, termites, ants, and other social insects. The case shows that the caste condition may arise by simple mutation from the non-caste condition, and that degrees and sexual differences in expression of caste may be due to other mutant genes (the enhancer) or to special peculiarities of the chromosome mechanism (here, attached Xs)."

NOTES ON COLLECTING, etc.

THE RESTING POSITION IN THE GENUS *EUPITHECIA*.—One notices a very considerable variation in the manner in which the various species rest in their natural state as regards the position of the abdomen—some have the terminal end dorsiflexed to an exaggerated degree, others much less so, and others practically straight, resting parallel to the surface on which they rest.

What is the significance of this variation? One would like to have notes of the whole genus. Up to the present I have notes of some 19 species and think they may be of general interest.

It cannot be merely a question of sex, as one notices most species rest in the same attitude peculiar to the individual species, when bred in numbers. I have noted one exception so far, although there are probably more. This is *pumilata*: I have found males resting "dorsiflexed" (slightly) and females "straight." The species that I have noticed resting "straight" are:—*centanreata* (*oblongata*), *denotata*, *vulgata*, *castigata*, *tenuiata*, *abbreviata*, *coronata* and *rectangulata*. The species resting "dorsiflexed" are:—*pulchellata*, *linariata*, *irriguata*, *nanata* (all slightly dorsiflexed); *pimpinellata*, *absinthiata*, *goosensiata*, *trisiagnaria*, *subnotata* and *valerianata* (more definitely "dorsiflexed").

It is not a question of recent emergence, as I have kept whole broods alive for some considerable time, and also found specimens on tree trunks and palings that were very worn, and still rested in their usual posture.—G. S. ROBERTSON, M.D., Struan, Storrington, Sussex. *March 6th, 1933.*

HELIOTHIS PELTIGERA IN 1932.—Larvae of this uncertain species were again present in fair numbers at a certain locality on the east Kent coast, although when I visited the spot early in August, they were so scarce, that a whole day devoted to a close search of the local food plant (*Senecio viscosus*) resulted in two larvae only being found, both quite small.

About the middle of September I was again on the same ground, and this time was surprised to find *peltigera* larvae in all stages of growth, and generally distributed over the district, wherever the food plant occurred. From this time till the end of the month, the weather

was mainly cold and squally, with a low night temperature, and it was remarkable that such sun loving larvae as *Peltigera* were able to exist under conditions so unsuited to their natural development.

I collected some 60 or 70 larvae and having an adequate supply of their natural food plant in my garden, experienced no difficulty in getting all but a few to go to earth. My subsequent experiences were interesting. Normally, larvae of this species pupate in from 10 to 12 days. Allowing a fortnight, I proceeded to turn over the soil in my breeding cages, but soon discovered that, in this case the time allowance was not sufficient. Extending this to a month, I carefully removed the soil and found among it about 2 dozen pupae and a large number of larvae spun up in their subterranean cocoons, still alive, but apparently lacking the requisite vitality to make the change. They eventually died. A close watch was kept for Dipterous parasites, but it appeared that the time of year when these larvae were found secured immunity from attack, for no parasites were bred, a contrast to my experience in 1931, when there was a heavy mortality from this cause among a number of larvae taken earlier in the year. I subjected the pupae to dry heat and, contrary to my results in 1931, when the few specimens I bred by the same method were very pale, and seemed to support the theory advanced by Mr. H. B. D. Kettlewell on page 64, Volume XLIII, I obtained on this occasion only one which was noticeably pale, the remainder, with one exception, to which I will refer later, show just that range in coloration and markings which one might see in any average series of bred specimens obtained without application of heat.

Forcing commenced at the end of October with a day temperature varying between 75° and 80° F., which fell to approximately 65° during the night. The first emergence took place on November 18th and afterwards the moths emerged at intervals until December 17th.

The one aberration obtained is interesting in that it is an exceptionally dark form, which one would not expect to result from forcing by the 'dry' method. The central area of the forewings has a broad blotch of a rich red brown colour, which extends from the wavy hind marginal line to the reniform, obliterating it and forming a transverse broad band, which at the bottom spreads along the inner margin towards the base, but does not quite reach it. The hindwings are normal.—W. G. WYNN, Buxted, Sussex.

PARARGE AGERIA, L., VAR. EGERIDES, STGR.—In this neighbourhood most of the *egerides* are characterised by deeper buff spots than usual and therefore approach the type, especially in the females.—C. NICHOLSON, Tresillian, Truro, Cornwall.

NEWSPAPER ENTOMOLOGY.—The following amusing paragraphs appeared in the February number of "The Etherium News":

"What is the most wonderful thing that has happened since Jonah came out of the whale? Amy Johnson's coming out of the Moth."

"A fly was taking a walk with her daughter upon a man's bald head. She said: What a difference time makes! Do you know, my dear, that when I was a girl this was just a footpath!" It is, I suppose, just possible that a house-fly and one of her daughters might be living imagines at the same time, but the second part of the story is, of course, doubly impossible, unless the unfortunate man lost all his hair within a week!—Id.

CURRENT NOTES AND SHORT NOTICES.

Before our May issue the momentous Centenary Celebration meetings of the Entomological Society of London will have taken place. On Wednesday, May 3rd there will be a General Meeting for the reception of delegates and presentation of addresses at 3 p.m. in the rooms of the Royal Geographical Society, Kensington Gore. At 8.30 p.m. there will be a scientific conversazione of *Fellows only* at 41, Queen's Gate. On Friday, May 5th, at 9.30 p.m. there will be a Reception given by His Majesty's Government to Fellows of the Society at Lancaster House, St. James's, S.W.1. The guests will be received by the Minister of Agriculture and Fisheries.

REVIEWS AND NOTICES OF BOOKS.

WHAT BUTTERFLY IS THAT? By G. A. Waterhouse, D.Sc., F.E.S. Large Octavo. 280 pp. 25 col. plates, 8 pls. black and white, and many text figs. Angus and Robertson, Sydney, Australia, 12/6 net.— This is one of the most useful and suggestive handbooks that one could wish to have on the Butterfly Fauna of any country. The letterpress and plates, with figures of all the species and larvae and pupae of the leading species in each genus, are equally good. The author has spent many years in exploring all parts of Australia, in working out the life-histories and geographical distribution. Previously, in conjunction with Lyell, he had published a more pretentious and expensive work on the same subject, to which he continually refers as well as to the writings of de Niceville, Watson and Wallace. A competent knowledge of the Indian and near Malayan species enables the author to compare species and forms, and family characters are discussed with reference to the world fauna. There are most useful sections on Variation, Distribution, the Principles of Classification, together with the elements of the study and general structure of the stages of these creatures. There must be in such a work a great deal of compression and this has been admirably done without loss of efficiency. Throughout, the introductions to each chapter or section bear the evidences of much practical work in breeding, etc., and are suggestive of further investigation of doubtful or unknown facts.

We regret the author has used the unnecessary, erroneous and absurd duplication of the specific name, and that he has used, or rather misused, the trinomial nomenclature indiscriminately for varied grades of relationship. For instance we have on page 78 no less than five cases of this latter use. *Euploea alecto monilifera*: only "3 specimens known." Surely *monilifera* cannot be a subspecies, it is merely a darkened female form. *Euploea climena malindera*: "2 males caught in November." In the old days of collecting, ere our knowledge was as extensive as now, every new form from a new area was dubbed a species, and the dealers made their prices; now it appears the appearance of an odd few somewhat different, forms from a new locality is hailed by a name of subspecific status and dealers deal again. At the most one could call these odd few "a race" until further experience taught us the true relationship. Far preferable would it be to use the indeterminate general title var. with its original, prior, and indefinite signification, a variation. *Euploea batesi belia*: "a rare

species." *Euploea guerini amyceus*: "10 specimens known," "all are variable." Which is *amyceus*? Are we to have 10 varietal names presently? *Euploea usipetes hippias*: "1 ♂ from Cape York and one ♀ from Thursday Island are the only known specimens." Called a subspecies without an atom of reason.

The get-up of the book is admirable and a credit both to author and publisher, and a work for the Commonwealth to be proud of.—Hx.J.T.

THE SENSES OF INSECTS.—By H. Eltringham, M.A., D.Sc., F.R.S., F.E.S., 125 pp., 25 illustrations. Methuen and Co., Ltd., 3/6.—A small book on an enormous subject by a great and clever exponent. Hitherto there has been no book dealing with the Senses of Insects as a whole*; the subject has scarcely now got out of the experimental stage; many hundreds of articles, papers, reports, etc., are scattered in biological literature all over the world. "A work of this sort" as the author says "must of necessity be largely a summary of the labours of others," but we may add that those who have been privileged to be present at Dr. Eltringham's many demonstrations will know that he does not blindly copy others. In many instances he supplements their information with the results of his own investigations as a skilled microscopist. A chapter on the Nervous Equipment of Insects is followed by three chapters on Eye structure and Vision. The Tactile, Auditory, etc., Organs are discussed and the book concludes with a useful Bibliography of nearly 150 references and a capital Index. The amount of information concisely and intelligently put in this little book is phenomenal. Those who know the works already issued in this series on Biological Subjects can rest assured that the volume is adequately produced.—Hx.J.T.

BITUARY.

Alan Druitt, F.E.S.

We regret to record the decease of Mr. Alan Druitt, F.E.S., of Christchurch, Hants, well-known for his interest in the Entomological Society of the South of England, whose President he was for 1932. On January 28th he read his Presidential Address, apparently in perfect health, on February 9th he passed away suddenly from thrombosis. A genial and kindly gentleman, he will be missed in the many associations with which he was connected. A solicitor, Clerk to the Guardians and to the Rural Council, Superintendent Registrar of Births, Marriages and Deaths, and particularly interested in aught connected with affairs of the beautiful old Priory Church and its surroundings, in spite of the handicap of the loss of a leg in early life, he left his mark on the amenities of the part of Hampshire in which he lived. From the first he gave his services unstinted to the flourishing Entomological Society of the South of England. He was a most successful breeder of the British Lepidoptera and had a goodly collection of exotic species taken during a trip to the 'Amazons, subsequently increased by additions. He was born in 1863 and had thus reached his 70th year.

* Since Lubbock's "Senses of Animals" about 1890.—E.A.C.

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EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should
be sent to Mr. H. J. TURNER, "Latemar," West Drive, Cheam.

Duplicates.—S. *Andrenaeformis*, Bred 1928, well set on black pins, with data.

Desiderata.—Very numerous British Macro Lepidoptera.—J. W. Woolhouse, Hill
House, Frances Street, Chesham, Bucks.

Desiderata.—Species of Dolerine and Nematine sawflies not in my collection; list
sent.—R. C. L. Perkins, 4, Thurlestone Road, Newton Abbot.

Duplicates.—*Albimacula**, *sparganii**.

Desiderata.—Ova of D.oo. pupae of X. *gilvago*, D. *caesia*. A. J. Wightman, "Aurago,"
Bromfields, Pulborough, Sussex.

EXCHANGES.—Living Eggs of *Catocala fraxini* and *sponsa*, exchange for butterflies of
British Isles.—C. Zacher, Erfurt, Weimar, Street 13, Germany.

Duplicates.—*Pyrallina**, *Salicis*, *Ianthina**, *Orbicularia**, *Repandata* in variety,
Doubledayaria, *Black rhomboidaria**, *Black virgularia** and others.

Desiderata.—*Hyale*, Welsh *aurinia*, *Polychloros*, *Tiphon Agathina*, *Lunigera*,
Lucernea, *Neglecta*, *Diffinis*, *Populeti*, *Gothica v. gothicina*, *White Leporina*, *Tridens*
Putrescens, *Littoralis*, *Typhae v. fraterna*, *Rurea v. Combusta*, *Gilvago*, *Fulvago v.*
flavescens, *Liturata v. nigrofulvata*. Harold B. Williams, Woodcote, 36, Manor Gate Road,
Kingston Surrey.

Duplicates.—A large number of species of European and Palaearctic *Rhopalocera*
and *Heterocera*.

Desiderata.—All British species especially those illustrating characteristics of an
island fauna. Dr. Lor. Kolb, München 54, Dachauer-str. 409, Germany, and Franz
Daniel, München, Bayer-str. 77, Germany.

Desiderata.—Living larvae or pupae of *Lasiocampa quercus*. Also set specimens of
same species taken before 1910 in Devon or Cornwall.

Duplicates.—*Pavonia*, set specimens or living stock: *Monacha*, ova: *ochroleuca*,
griseola, *advenaria*, *juniperata*, *thetis*, etc.—J. A. Downes, 5, Trinity Road, Wimbeldon.

URGENT.—Wanted English (Cumberland) *Erebica epiphron*. Adequate exchange
will be made in European Lepidoptera.—B. C. S. Warren, 14, Avenue de l'Eglise
Anglaise, Lausanne, Switzerland.

I am seeking an opportunity of exchanging Macro- and Micro-Lepidoptera with
English collectors and beg to send list of duplicates.—J. Soffner, Trautenau (Bezirksbehörde),
Bohemia, Tschechoslowakische Republik.

JAPANESE INSECTS.—Will anyone who wishes to acquire Japanese Insects of all sorts
in exchange for insects from any other part of the world (but particularly Britain) please
communicate with me?—P. Siviter Smith, Pebworth, Nr. Stratford-on-Avon.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7.
8 p.m. May 3rd.

The South London Entomological and Natural History Society, Hibernia
Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m.
April 27th. May 11th, 25th.—Hon. Secretary, S. N. A. Jacobs, "Ditchling," Hayes
Lane, Bromley, Kent.

The London Natural History Society.—Meetings first four Tuesdays in the
month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel
Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through
Members, or from the Hon. Sec. A. B. Hornblower, 91, Queen's Road, Buckhurst Hill,
Essex.

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IMPORTANT

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An Account of my Studies in the Biology of *Pieris rapae*, Linné. II.

By ORAZIO QUERCI.

In a communication, which I made to the meeting of October 27th, 1932, of the American Entomological Society of Philadelphia, I related the result of my research about the life-history of *Pieris rapae*, based on large collecting and breeding and some temperature experiments. My paper is printed in the "*Entomologist's Record*," XLIV. p. 168 (1932). Here I am recording a more complete conclusion and adding new facts.

In the year 1932, at Philadelphia, Pa. *P. rapae* began to emerge on May 15th, and continued to emerge until the 20th of the same month. After a pause of 13 days it emerged again on June 2nd and was on the wing until October 15th.

From May 15th to September 15th the weather varied very little and I found that nearly every batch of eggs, which I reared, although laid by a single female, hatched at the same time after 4 or 5 days, but while some larvae grew rapidly and became full grown in 7 days, others required 8 to 14 days, and the imagines emerged from the chrysalides in from one to two weeks. *In all my breedings the whole life-cycle never was shorter than 18 days nor longer than 28 days.*

Therefore, I think I am right in stating that, both in spring and summer of 1932, a new brood began to emerge in the field in less than 20 days after its preceding brood, and that at least eight broods of *P. rapae* have occurred at Philadelphia.

As the emergences continue for about 10 days beyond the minimum (18 days after egg-laying) we must have an increase in the duration of the flying period of each successive brood. Besides this, there is another cause of increase due to the fact that some females are on the wing, laying eggs, for about 6 days after their emergence. In total, therefore, *the flying period of each brood should be at least 15 days longer than that of its preceding brood.*

In the following table I am attempting to show how probably the eight broods of *P. rapae* occurred at Philadelphia.

Brood	Emergence began	Emergence ended	End of flight	Days on wing
First	May 15	May 20	May 26	12
Second	Jun. 2	Jun. 22	Jun. 28	27
Third	Jun. 19	Jul. 24	Jul. 29	43
Fourth	Jul. 7	Aug. 28	Sep. 3	59
Fifth	Jul. 25	Oct. 1	Oct. 10	78
Sixth	Aug. 12	(*)	(*)	(*)
Seventh	Aug. 29	(*)	(*)	(*)
Eighth	Sep. 18	(*)	(*)	(*)

(*) Not all the chrysalides of the last three broods will emerge this year. A few chrysalides of the sixth, some of the seventh and many of the eighth brood will go over winter, together with those which might produce a ninth brood, if the season favourable to the emergence of the Lepidoptera is not too short as it happened this year. The chrysalides which will survive will emerge altogether in the spring of 1933.

The data which I record in my table for the beginning of each brood are probably correct, because, as I already said, from most lots of eggs which I have reared until September 15th (when the temperature dropped) some imagines emerged after 18-19 days. That occurred with the greatest regularity. In fact, it is hard to say when the last specimens of every brood emerged.

In an attempt to solve this question I have carefully examined the *P. rapae* in my collection to see if I might find any character, peculiar to the specimens of the same brood, and different from those of the other broods.

All the specimens were taken at the same place in a field near the Fairmount Park of Philadelphia. My wife and I visited that locality every day, also when it was cloudy or raining, as we needed to get plants to feed our larvae. We went there in the morning and returned again to collect in the afternoon when, owing to the heat, the butterflies rest among the tall grass and in the shade of the trees, and it was easy to catch them. Often, two young German friends of mine helped us to collect.

I set the Lepidoptera within rectangular envelopes, made with transparent paper, taking care not to injure those insects which must remain alive. At home I separated both the species and forms.

For the *P. rapae* I selected first all the abnormal ones and later I mounted them. The other specimens were measured, without taking them from the envelopes, and placed in two lots: one of examples having the length of the forewing shorter than 24mm. from the base to the tip, the other of the larger ones. Each of these two lots was subdivided according to the tint: either black or grey, of the tip of the wings. This character is better perceptible when we look for transparency at folded butterflies. When the separation was made I recorded the number of males and females of every form, and later I selected, from the four lots of the most common forms, a few examples to be mounted, and put the others into the cages to fly.

At Lisbon I made a more careful separation of the 747 males and 917 females which I had mounted. I preferred to measure the length from tip to tip of the forewings, instead of measuring one wing alone, because my butterflies are uniformly set with the low margin of the forewings along a line perpendicular to the axis of the body, and measuring is quicker and more exact. To the length of 24mm. for one wing, which I took as a base when measuring folded *P. rapae*, it generally corresponds (except in those of the first brood): 40mm. of expanse when the wings are spread.

In the following table I record the number of males and females of every form of *Pieris rapae* taken at Philadelphia in the year 1932.

Length from tip to tip of the forewings in mounted specimens.

Month	Days	less than 40mm.						36 to 40mm.						40 to 44mm.						more than 40mm.						Total			
		29 to 36mm.			pale			dark			pale			dark			pale			dark			pale				dark		
		♂	♀	♀	♂	♀	♀	♂	♀	♀	♂	♀	♀	♂	♀	♀	♂	♀	♀	♂	♀	♀	♂	♀	♀		♂	♀	♀
May	1-14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	
	15-20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	53	
	21-31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	
Jun.	1-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16	
	6-10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	64	
	11-15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	66	
	16-20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	131	
	21-25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	43	
	26-30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	31	
Jul.	1-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	40	
	6-10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	227	
	11-15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	269	
	16-20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	492	
	21-25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	479	
	26-31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	181	
Aug.	1-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	97	
	6-10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	77	
	11-15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	654	
	16-20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	884	
	21-25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	835	
	26-31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	592	
Sep.	1-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	652	
	6-10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	73	
	11-15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	50	
	16-20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	629	
	21-25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	488	
	26-30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	34	
Oct.	1-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	29	
	6-10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	19	
	11-15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15	
	16-28	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	
		25	69	24	38	962	492	458	280	1936	779	1364	628	37	45	53	30							7220					

To know whether for every brood there is either a peculiar or a dominant form, or not, I have regrouped the preceding data as it is shown in the following table :

Number of specimens of the different forms of *Pieris rapae* taken at Philadelphia in the year 1932, with the same numbers (in parentheses) reduced per cent.

Broods	Month	Days	Length from tip to tip of the forewings in mounted butterflies.										Total	
			Smaller than 40mm.		36-40mm.		40-44mm.		Larger than 40mm.		dark	pale		
			29-36mm.		36-40mm.		40-44mm.		44-49mm.					
			dark	pale	dark	pale	dark	pale	dark	pale				
1st	May	15-20	—	—	11 (22)	6 (10)	11 (22)	11 (22)	7 (12)	7 (12)	7 (12)	53 (100)		
2nd	June	3-20	—	—	53 (20)	15 (6)	90 (32)	67 (24)	29 (10)	23 (8)	23 (10)	277 (100)		
2nd and 3rd ..	June	21-30	—	—	13 (18)	12 (17)	16 (22)	15 (21)	8 (10)	10 (12)	10 (12)	74 (100)		
3rd	July	1-5	—	—	6 (15)	4 (10)	16 (40)	8 (20)	1 (3)	5 (12)	5 (12)	40 (100)		
3rd and 4th ..	July	6-25	12 (1)	13 (1)	361 (24)	172 (12)	543 (37)	337 (23)	13 (1)	16 (1)	16 (1)	1467 (100)		
3rd, 4th and 5th ..	July	26-31	8 (4)	4 (2)	40 (22)	30 (17)	51 (28)	43 (24)	2 (1)	3 (2)	3 (2)	181 (100)		
4th and 5th ..	Aug.	1-10	4 (2)	3 (2)	44 (25)	37 (22)	44 (25)	38 (22)	2 (1)	2 (1)	2 (1)	174 (100)		
4th, 5th and 6th ..	Aug.	11-31	29 (1)	20 (1)	644 (21)	241 (7)	1151 (39)	865 (29)	8 (1)	7 (1)	7 (1)	2965 (100)		
5th, 6th and 7th ..	Sep.	1-15	6 (1)	2 (1)	128 (16)	75 (9)	311 (40)	244 (31)	4 (1)	5 (1)	5 (1)	775 (100)		
5th, 6th, 7th and 8th ..	Sep.	16-30	32 (2)	17 (2)	152 (13)	128 (11)	457 (39)	356 (31)	7 (1)	2 (1)	2 (1)	1151 (100)		
6th, 7th and 8th ..	Oct.	1-15	3 (5)	3 (5)	2 (3)	18 (29)	25 (39)	8 (12)	1 (2)	3 (5)	3 (5)	63 (100)		
			94 (1)	62 (1)	1454 (20)	738 (10)	2715 (38)	1992 (28)	82 (1)	83 (1)	83 (1)	7220 (100)		

In the preceding table the sequence of the broods is set almost in accordance with the data of the table at page 1. The numbers of specimens of every form are also reduced per cent. to make possible their comparison.

The whole surface of the wings of the *P. rapae* of the first brood, which emerged from May 15th to 20th of 1932, is smaller than in the specimens, which emerged later having the same expanse of wings from tip to tip. In my set there are small examples : 36-40mm. (32%) ; middle size ones : 40-44mm. (44%) ; and large ones : 44-48mm. (24%). There are no specimens smaller than 36mm. The pattern of the wings is in

most cases reduced, but the apical scales, which remain, are either black (56%), or grey (44%).

The *P. rapae* on the wing from June 3rd to 20th surely belonged to the second brood. In my series there are no dwarf specimens; 26% are small, 56% of middle size and 18% are large. The apical patch is either black (62%), or grey (38%).

Before making these statistics I was convinced that the *P. rapae* of the second brood should be large and pale at the tips of the wings, but now I am seeing that this form occurs only in the 8% of the specimens taken by the end of spring. Remembering our European captures I must agree that this happened almost everywhere we collected. I think that the mistaken judgment about the *P. rapae* of the second brood is due to the fact that the largest specimens are striking and they raise a desire to get them, while the smaller ones do not attract. The beautiful June *P. rapae* accumulated, year by year in the collections produce in the observer a conviction which does not agree with what really happens in nature.

From my breeding data I inferred that the third brood began to emerge at Philadelphia on June 19th or 20th, and that its specimens overlapped with those of the second brood, which continued to emerge for a few days after that time. From June 21st to 30th the *P. rapae* were scarce, but among the 74 specimens, which we took, most must be of the third brood. I found in my series 35% small, 42% middle size, and 22% large *P. rapae*. The number of these last is larger than when the second brood emerged alone.

By the end of June the second brood had almost certainly ended emergence and the fourth had not yet begun. From July 1st to 5th the *P. rapae* were very scarce, but all the fresh ones should belong to the third brood. In my set there were 25% small (36-40mm.), 60% middle size (40-44mm.), and 15% larger than 44mm.

From June 21st to July 5th most *P. rapae* were of the third brood; 54% of them having a black tip, and 46% a grey one. I must agree that it is not correct to say that the specimens of the third brood are of middle size and with the tip of the forewings deep black.

As also in summer some imagines, from my breedings, continued to emerge 19 days after egg-laying I expected that some *P. rapae* of the fourth brood would have been on the wing on July 7th. On that day I found the first dwarf specimen of the year, and thought that the examples of the fourth brood should be very small. Also in this case the result of the study of the collection does not confirm my idea, as among 1476 *P. rapae* taken from July 6th to 25th, that is when probably the specimens of the third and fourth broods emerged altogether, there are only 25 *P. rapae* (less than 2%) having an expanse of wings smaller than 36mm.

From July 26th to September 30th we found almost every day all the different forms of *P. rapae*. The middle size ones were always prevailing (47 to 70%), those of small size being also frequent (25 to 47%). The average of dwarf *P. rapae* varied from 2 to 6%, that of the larger ones remained always less than 2%.

The statistics based on the 63 *P. rapae* taken in the first fortnight of October have little value as, owing to the troubled meteorological conditions, we were able to catch only a few specimens, and not many as in summer.

My conclusion is that this year, at Philadelphia, no form prevailed in any brood except in the first. I cannot say whether this occurs also in Southern Europe, where the quantity of *P. rapae* is always so scarce during the summer that it is useless for statistics. At Cuença, in Central Spain, with a very favourable season and catching all the *P. rapae*, which we saw, from July 6th to September 5th, we took 57 specimens. This figure is very small if compared with the 5440 *P. rapae* collected at Philadelphia in the same period of two months in the year 1932. I believe that this year *P. rapae* has been exceptionally plentiful in Pennsylvania, because in July and August of 1931 when we visited our collecting place at Parkway every day, we saw not even 30 *P. rapae* on the wing.

In my collection there are 156 *P. rapae*, which I refer to the dwarf form: smaller than 36mm. from tip to tip. If I had set in this lot only those smaller than 35mm. their quantity would have been about half. The lot of *P. rapae* larger than 44mm., are 165 in my set, but only 80 of them have more than 45mm. of expanse. Therefore the really striking examples we took this year, were no more than 150, that is 2% of the 7220 *rapae* which I examined to make the statistics.

LEPIDOPTERA AT MAURIN, BASSES-ALPES, FRANCE,

From mid June to September 8th, 1932.

Based on the Observations of A. E. BURRAS, F.R.E.S., W. PARKINSON CURTIS, F.R.E.S., and W. FASSNIDGE, M.A., F.R.E.S.

(Continued from page 37.)

HETEROCERA.

Ilema complana, L. *I. lurideola*, Zinck. *Endrosa aurita*, Esp. var. *ramosa*, Fb., a few. *Nudaria mundana*, L., one specimen, W.F. *Euprepia cribraria*, L. var. *candida*, H.-S., common at light; W.P.C. has a specimen suffused pinkish, with the entire submedian as far as vein 2 heavily scaled with black, the subcostal scaled black, and the nervures of the hindwings picked out in brown. *Parasemia plantaginis*, L., rare; var. *hospita*, S. and D., by W.F. *Arctia caja*, L.

NOCTUAE.

Chloridea dipsacea, L. *C. peltigera*, Schiff. *Actinotia radiosa*, Esp. *Aechmis comma*, Schiff., fairly rare. *Euxoa fatidica*, Hb., one ♂, A.E.B. *E. segetum*, Schiff., a slaty grey, rather dark form, not apparently noticed by Tutt, *British Noctuae*, Vol. 2. *E. corticea*, Schiff., mainly neutral grey (Ridgway) in tone with the barest tinge of raw sienna. The black scaling is very sooty and the insect lacks the warmth of British specimens. Given the above general tone the forms obtained are referable to *virgata-pallida*, *irrorata-pallida*, *obsoleta-fusca* (the most usual form) *brunnea* and *obscura*: no nomotypical form was taken. *E. cinerea*, Schiff. var. *alpigena*, Turati, ♂ fairly common, A.E.B. *E. puta*, Hb. var. *venitens*, Hb. *E. biriva*, Schiff., fairly rare. *E. grisea*, Fb., fairly common. *E. decora*, Schiff., common and variable; W.P.C. took ab. *flavomaculata*, Schaw., ab. *livida*, Stgr., and two forms that seem to have escaped a

name, one a soft leaden grey, and one with a very strong median shade. *E. simplonia*, Geyer, common, both the typical form and ab. 1, Hampson, *Cat. Lep. Phal.* Vol. IV, p. 241 [*obsolescens*, Strand (Hy. J. T.)]. *E. nigricans*, L., rare. *E. denticulosa*, Esp., 4 specimens. *E. recussa*, Hb., common. *E. vitta*, Esp., fairly common at light at the end of August. *E. signifera*, Schiff., rare. *E. celsicola*, Bellier, fairly common. *E. lucipeta*, Schiff., 8 specimens. *Feltia exclamationis*, L., rare. *Opigena polygona*, Schiff., rare. *Agrotis ypsilon*, Rott. *A. musiva*, Hb., fairly common. *A. pronuba*, L. *A. depuncta*, L., rare. *A. multangula*, Hb., rare. *A. rectangula*, Schiff. var. *andereggii*, Boisd., common. *A. augur*, Fb. *Epipsilia cuprea*, Schiff., common at flowers and light. *E. lucernea*, L., fairly common. *E. helvetina*, Boisd., fairly common. *E. latens*, Hb., rare. *E. candelarum*, Stgr. and var. *signata*, Stgr., fairly common. *Lycophotia saucia*, Hb., 2 bred, A.E.B. *L. elegans*, Eversmann, fairly common. *L. larixia*, Gn., fairly common towards the end of August. *L. ocellina*, Schiff. and *L. alpestris*, Boisd.; Culot, *Noctuelles et Géomètres de l'Europe*, Vol. 1, p. 54, states that the separation of these two species is very easy "par l'examen du thorax qui est brun fauve chez *ocellina* tandis qu'il est du ton des ailes supérieures chez *alpestris*." All the specimens taken have the thorax unicolorous with the forewings, and we therefore refer them to *alpestris*, which was common. *L. renigera*, Hb., fairly rare. *Mythinna sobrina*, Boisd., rare. *M. oxalina*, Boisd., fairly rare. *Triphaena fimbria*, L. *Barathra brassicae*, L. *Scotogramma nana*, Hufn. var. *microdon*, Haw., 9 specimens.* *S. trifolii*, Rott. *Miselia proxima*, Hb., common. *M. serratilinea*, Tr., very common, a nuisance at light as it is a powerful insect and very restless. *M. advena*, Schiff., fairly rare. *M. pisi*, L., common, chiefly the dark purplish form *rukavarae*, Hufn. *M. dentina*, Schiff., common, mostly var. *latenai*, Pierret; W.P.C. took a specimen with the basal portion of the forewing below vein one of a lively yellow. *M. glauca*, Kleemens, rare, A.E.B. *M. dysodea*, Schiff. *M. serena*, Schiff., one only of the Mediterranean form *obscura*, Stgr. *M. carpophaga*, Borkh. *M. tephroleuca*, Boisd., 8 specimens. *M. conspersa*, Schiff., rare. *M. compta*, Schiff., rare. *Hadena reticulata*, Vill., fairly common; unlike English specimens, being dark fuscous or sepia with a blackish tone. On the sheet they have a deceptive likeness to *L. elegans* and *L. larixia*. *Tholera popularis*, Fb., ♂♂ common. *Chabuata conigera*, Schiff., rare. *Eriopygodes imbecilla*, Fb., 2 ♀♀ by A.E.B.; ♂♂ common, often on flowers by day. *Sideridis lithargyria*, Esp. *S. albipuncta*, Schiff. *S. vitellina*, Hb., a few. *S. evidens*, Hb., a few. *S. caesia*, Schiff., fairly common, mostly of the form *nigrescens*, Stgr. *Cerapteryx graminis*, L., fairly common on flowers by day; a pale undersized form. *Cirphis comma*, L., common, a dull undersized form. *Leucania pallens*, L. *Cucullia absinthii*, L., one at light, W.P.C.; larvae rare, W.F. *C. lactucae*, Schiff., rare. *C. thapsiphaga*, Tr.; both A.E.B. and W.F. found larvae attributed to this species commonly on *Verbascum* ? sp.; they were heavily parasitised but it is hoped to breed some moths. *C. lychnitis*, Rmbr., a few, larvae common, A.E.B. and W.F. *C. verbasci*, L., a few, larvae common. *Calophasia lunula*, Hufn., one specimen.

* Warr.-Seitz gives *microdon*, Gn., as the dark form of *Scotogramma marmorosa*, Bork. (*odontites*, Bdv.), and *Polia nana*, Hufn. for *dentina*, Schiff.—Hy.J.T.

Bombycia viminalis, Fb. *Derthisa trimacula*, Schiff., 7 ♀♀, one ♂. *Eumichtis adusta*, Esp., fairly rare, undoubtedly referable to the var. *chardingi*, Dup., and even darker than specimens of this var. that W.P.C. has from Kieff (Russia). *Dasypolia templi*, Thunb., one ♂, A.E.B. *Cosmia fulvago*, L., and var. *flavescens*, Esp. *Parastichtis sublustris*, Esp., fairly rare, small and strongly coloured. *P. monoglypha*, Hufn. *P. rurea*, Fb., one specimen. *Trachea basilinea*, Schiff., one specimen, A.E.B. *T. furva*, Schiff., common. *T. anceps*, Schiff., rare. *T. secalis*, L. *Proctus strigilis*, Cl., a few typical specimens. *Agroperina lateritia*, Hufn., fairly common. *Eremobia ochroleuca*, Schiff., two specimens. *E. platinea*, Tr., rare. *E. zeta*, Tr., and var. *pernix*, Geyer, fairly rare. *E. maillardi*, Geyer, fairly common. *Palluperina testacea*, Schiff. *Trigonophora meticulosa*, L., a few larvae. *Bryophila perla*, Schiff., the form is almost identical with var. *pyrenaea*, Obthr. *B. galathea*, Mill., rare. *Acrionicta rumicis*, L. *A. auricoma*, Schiff., rare. *A. megacephala*, Schiff., insects and larvae. *A. euphorbiae*, Schiff. *Laphygma exigua*, Hb., a few. *Athetis alsines*, Brahm, common. *A. blanda*, Schiff. *A. rougemonti*, Spuler, rare. *A. flavirena*, Gn., var. *noctivaga*, Bell., fairly common. *A. claripalpis*, Scop. *Acosmetia palustris*, Hb., ♂ fairly common, A.E.B. *Enargia paleacea*, Esp., rare. *Calamia virens*, L., fairly common. *Euclidimera mi*, Cl., A.E.B. *Gonospileia glyphica*, L., A.E.B. *Syngrapha ain*, Hoch., three specimens. *Phytometra iota*, L., rare. *P. gamma*, L. *P. bractea*, Schiff., rare. *P. variabilis*, Piller, fairly common, larvae found on *Aconitum lycoctonum*, L. *P. chryson*, Esp., one specimen. *P. chrysitis*, L., rare. *Acontia luctuosa*, Esp. *Calpe capucina*, Esp., one specimen. *Antarchaea viridaria*, Cl.

Hypena obesalis, Tr., one specimen. *Dasychira fascelina*, L. *Stilpnolia salicis*, L. *Euproctis phaeorrhaea*, Don., one at light, W.P.C. *Herse convolvuli*, L., a few. *Amorpha populi*, L., a few, a form with the ground colour ashy grey. *Haemorrhagia tityus*, L., one specimen, A.E.B. *Macroglossum stellatarum*, L. *Celerio euphorbiae*, L., a few. *C. vesperilio*, Esp., a few at light; for remarks on the larvae see ante. *C. lineata*, Fb., var. *livornica*, Esp., one specimen. *Pergesa elpenor*, L., one seen by W.P.C. flying at flowers of *Echium*. *P. porcellus*, L., a few. *Palimpsestis* or, Fb., larvae common. *Cerura furcula*, Cl., A.E.B. *C. bifida*, Hb., and larvae, fairly common. *Dicranura vinula*, L., and larvae, common. *Pheosia tremula*, Cl., and larvae, fairly common. *Notodonta ziczac*, L., brightly coloured specimens; larvae fairly common. *N. phoebe*, Siebert, a few by A.E.B. *Pterostoma palpina*, L., larger and more variegated than British specimens; fairly rare. *Pygaera curtula*, L., larvae common. *P. pigra*, Hufn., larvae common.

GEOMETERS.

Abraxas grossulariata, L. *Lomaspilis marginata*, L., and larvae. *Cabera pusaria*, L. *C. exanthemata*, Scop. *Ellopiia fasciaria*, L., A.E.B. *Crocallis elingvaria*, L., rare. *Ourapteryx sambucaria*, L. *Opisthographis luteolata*, L., A.E.B. *Epione repandaria*, Hufn., bred by W.F. *E. vespertina*, Fb., a few. *Pseudopanthera macularia*, L., in July, A.E.B. *Gnophos dumetata*, Tr., var. *daubearia*, Boisd., fairly common. *G. ambiguata*, Dup., rare. *G. glaucinaria*, Hb., abundant and variable. *G. myrtillata*, Thunb., and var. *obfuscaria*, Hb., very common. *G. sordaria*, Thunb., var. *mendicaria*, H.-S., rare. *G. occidentalis*, Obthr.,

fairly common from mid August; this species has been separated from *G. zelleraria*, Freyer. *Orphne tenebraria*, Esp., one ♂, A.E.B. *Psodos caniculata*, Hoch. (*trepidaria*, Hb.), fairly common in high pastures, with *P. coracina*, Esp. *P. quadrifaria*, Sulzer, common in July and early August; in pastures at 8,000 feet. *Pygmaena fusca*, Thunb., a few. *Ematurga atomaria*, L. *Itame wauaria*, L., fairly common. *Diastictis artesiaria*, Schiff., fairly common. *Chiasmia clathrata*, Hb. *Tephрина murinaria*, Schiff., one by A.E.B. *Crocota lutearia*, Fb., common. *Rhodometra sacraria*, L., rare and scattered. *Lythria plumularia*, Freyer, fairly common in July, Col Marry. *L. purpuraria*, L., one by W.F. *Larentia clavaria*, Tr., common. *Otholitha cheno-podiata*, L., fairly common. *O. bipunctaria*, Schiff., common. *O. octodurensis*, Favre, specimens approaching var. *gallica*, Wehrli; one by W.F. nearly unicolorous black. *Anaitis praeformata*, Hb., rare. *A. simplicata*, Tr., one specimen, A.E.B. *Nothopteryx sabinata*, Hb., fairly common; this species usually feeds on juniper, but almost certainly has a substitute foodplant at Maurin, where juniper is very scarce. *Oporinia dilutata*, Schiff., one bred by A.E.B. *Triphosa sabaudia*, Dup., fairly common; every night a few specimens came into our bedrooms and sought out the darkest corners at dawn. *T. dubitata*, L., and var. *cinereata*, Steph., a few. *Calocalpe cervinalis*, Scop., fairly common, A.E.B. *Philereme transversata*, Hufn., rare. *Lygris prunata*, L., common. *L. populata*, L., common. *Cidaria fulvata*, Forster, fairly rare. *Lycometra ocellata*, L., rare. *Thera cognata*, Thunb., var. *gueneata*, Feisth., fairly common. *Dysstroma citrata*, L., common and excessively variable. *Xanthorhoe munitata*, Hb., rare. *X. fluctuata*, L. *X. montanata*, Schiff. *Colostygia aptata*, Hb., common. *C. olivata*, Schiff., fairly common. *C. turbata*, Hb., fairly rare. *C. aqueata*, Hb., common. *C. salicata*, Hb., and var. *ablutaria*, Boisd., fairly common. *C. didymata*, L., common. *Entephria caesiata*, Schiff., fairly common. *E. infidaria*, de la Harpe, several by W.P.C. *E. cyanata*, Hb., common. *E. nobiliaria*, H.-S., a few; the foodplant *Saxifraga oppositifolia*, L., was abundant near the snow at Panestrel, and it seems likely that we overlooked this species among the crowds of Geometers at the lamps. **Coenoteophria verberata*, Scop. *C. tophaceata*, Schiff., rare. *C. nebulata*, Tr., rare. *C. achromaria*, de la Harpe, a few. *C. obsoletaria*, H.-S., three by W.F., four by A.E.B.; this species does not appear to have been taken in France since the publication of Berce, *Faune Entomologique Française: Lépidoptères*, 1873. *C. berberata*, Schiff., common. *Euphyia frustata*, Tr. ab. *fulvocinctata*, Rmbr., fairly rare. *E. scripturata*, Hb., fairly common, A.E.B. *E. cuculata*, Hufn., two specimens. *E. molluginata*, Hb., rare. *Epirrhoe tristata*, L., eight specimens by A.E.B. *E. pupillata*, Thunb., one specimen by A.E.B. *E. galiata*, Schiff., rare. *E. rivata*, Hb., rare. *E. alternata*, Müller. *Perizoma taeniata*, Steph., rare. *P. hydrata*, Tr., rare. *P. minorata*, Tr., common. *P. albulata*, Schiff., fairly common. *Hydriomena furcata*, Thunb., very common

* Pungeler says that *L. nobiliaria* will go through the winter if furnished with fresh and withered rose leaves and in spring easily reared on *Saxifraga umbrosa* from the garden patch. *Sax. oppositifolia* is one of the earliest *S.* to appear and is apparently affected by *S. nobiliaria* presumably as a matter of specific domestic economy.—Hy.J.T.

and excessively variable; A.E.B. took three striking forms. *Eupithecia linariata*, Fb., rare. *E. venosata*, Fb., rare. *E. alliaria*, Stgr. *E. egenaria*, H.-S., by W.P.C. *E. fenestrata*, Mill., a few. *E. icterata*, de Vill. form *cognata*, Steph., a few. *E. semigraphata*, Bruand, common. *E. graphata*, Tr. *E. lariciata*, Freyer, common. We took several other species of *Eupithecia*, but have not yet succeeded in identifying them with certainty. *Horisme vitalbata*, Schiff., rare. *H. calligraphata*, H.-S., fairly common, A.E.B. *Rhodoströphia vibicaria*, Cl., rare. *Scopula immorata*, L., rare. *S. incanata*, L., fairly common. *S. decorata*, Schiff., common and variable. *Sterrhä rufaria*, Hb., common. *S. flaveolaria*, Hb., very common. *Hipparchus papilionaria*, L., rare. *Hemistola chrysoprasaria*, Esp., rare. *Odezia atrata*, L. very abundant. *Lemonia taraxaci*, Esp., one specimen, A.E.B.

(To be continued.)

NOTES ON COLLECTING, etc.

PYRAMEIS ATALANTA AND AGLAIS URTICAE IN MARCH.—I have received the following message from the keeper of Start Point Lighthouse, Stokenham, Kingsbridge, Devon.

"On Saturday, March 11th, 1933, between 12 noon and 1 p.m., I noticed several Tortoiseshell and one Red Admiral butterflies flying along the roadside; their condition seemed to be perfect. Weather conditions at time of observation: Wind S.E., force 3; sky almost clear; shade temperature 49°, but rather warm in the sun." As there was only one *atalanta* it does not appear that there had been an immigration.—C. NICHOLSON, Tresillian, Cornwall.

"NOTES FROM IRELAND."—It may be as well to point out that the plants called "ragweed" in Ireland (and Scotland) are species of the genus *Senecio*, which are usually known as "ragworts" in England. The one mentioned by Canon Foster (pp. 37 and 38) as growing in marshy places is no doubt *S. aquaticus*; elsewhere *S. jacobaea* would be the attraction probably. Both these species are found throughout Ireland, and *S. jacobaea* is the productive one along our coasts, but, curiously enough, rarely inland in my experience.

The real ragweeds are American plants of the genus *Ambrosia*, belonging also to the natural order *Compositae*, but very different in appearance from, and not closely related to, the ragworts. Several of the species are occasionally found in Britain as aliens.—ID.

NOMENCLATURE.—Would it not be better to substitute "Subspecies" for Mr. Gunder's "Race" (p. 48), as you suggest, and "Race" for "Local Form," the latter being in all probability an incipient subspecies? then "Local Form" would drop out altogether. In the "Transition Form" table words in italics should come next the bracket and be in pearl ordinary and the words in ordinary pearl (melanism, etc.) should be in italics after the dashes. The recognised abbreviation for Hybrid should be *Hyb.*, and for Synonym, *Syn.* but I don't consider "Unnamable" = "Synonymous." Several of the groups included are already recognised by separate terms, e.g., Hermaphrodites (Gyn.) and others could be, e.g., Aberrations (Ab.).—ID.

FEMALES OF *EREBIA SCIPIO*, BOISD.—In the March number of this Magazine, in an article on the Basses Alpes, the question is asked on page 34:—"How does one capture ♀♀ of *Erebia scipio*, Boisd.?" I can answer this question as far as one locality in the Basses Alpes is concerned.

On July 24th, 1928, when staying at Digne, I made an expedition to the Montagne de Lure, which lies west of the River Durance, and about 30 kilometers due west of Digne. This "mountain" consists of a long ridge with a very gentle slope to the south, mostly covered with grass, on which *Melanargia cleanthe* flies in profusion. The western portion of the ridge is covered with loose stones on a gentle incline, and directly one leaves the grass and arrives on the stony ground one begins to see *scipio*. Males and females fly together on the same ground, and are easy to catch owing to the gentle slope. I did not discover the stony ground until the afternoon, and had, therefore, only about an hour to spend in catching *scipio*; during that hour, however, I took 8 females besides about 30 males, all beautifully fresh with the exception of a few males. No doubt I could have taken many more had I chosen to return next day, but I had all I required.—BRIG.-GENERAL B. H. COOKE, Inniscrona, Datchet, Bucks.

CURRENT NOTES AND SHORT NOTICES.

We have been reminded that it about this part of the year that we appeal to our readers for the Wicken Fen Fund. With the strictest economy the Fen has been cared for hitherto, but it is very necessary to continue to support it, as under modern circumstances little or no income can be relied on from the fen itself. Care has to be taken that no growth is excessive so that the present flora and fauna may continue under favourable conditions, and thus a certain amount of labour must be used in addition to the mere caretaking and watching.

A meeting of the Entomological Club was held at "Caracas," Ditton Hill, on March 16th, 1933, Mr. W. J. Kaye in the Chair. *Members Present* in addition to the Chairman:—Mr. Horace Donisthorpe, Prof. E. B. Poulton, Mr. H. Willoughby-Ellis, and Mr. Jas. E. Collin. *Visitors Present*:—Mr. A. Hall, Mr. Hugh Main, Mr. W. Rait-Smith, Dr. Karl Jordan, Dr. E. A. Cockayne, Capt. N. D. Riley, and Mr. F. A. Oldaker. The meeting was called for 6.30 p.m., and on arrival the guests were received by Mr., Mrs. and the Misses Kaye. After refreshments has been dispensed, the Chairman's collections were inspected and especially notable were two drawers of Jamaican butterflies, including his recently described new species and sub-species. A long series of the usually rare *Lucidia cadma* was included. These were all males. Recently Prof. Poulton had received three females, which although similar to the males were rather lighter in colour and slightly larger. Supper was served at 8 o'clock, and after a very enjoyable evening the guests dispersed about 11 p.m.

We have received the following personal separates.

Mr. Siviter Smith. A figure and description of a striking aberration of *Rumicia phlaeas* to which he has given the name *berviniensis*; it was taken in the Berwyn Mts. of N. Wales.

Doctor Walther Horn. An Account and Criticism of the doings of the Nomenclature Commission at the International Zoological Congress held at Padua in 1930.

Only a short time ago we referred to the *Boll. Lab. Zool. Agr.* of Portici, Italy, Vol. XXIV. which was somewhat late in appearing. Now we have before us the succeeding volume of the same annual, which brings the matter they have been working at up to date. Vol. XXV. contains nearly 350 quarto pages and a vast number of sketches and illustrations wherever the text needs elucidation for clarity. One article interests us greatly. It is that of Dr. Martelli, "A Contribution to the Knowledge of *Aporia crataegi*, and of its Parasites and Epiparasites." An exhaustive and intensive study of the species in all its relations to its surroundings. It is not a mere summary of what others have done, but includes a vast amount of original investigation of the parasites and epiparasites, *Chalcididae*, *Ichneumonidae*, *Braconidae* and *Diptera-Tachinidae*, and each species involved dealt with in the same intensive way. The paper is a very excellent example of the efficient and thorough work, which is carried on at the R. Instituto Superiore Agrario in Portici. We have not space to deal with the rest of the volume in detail. The remaining articles are not so comprehensive, perhaps, but are equally well produced, arranged and illustrated and must be important factors in the study of the subjects of which they treat.

A separate of the *Indian Jr. of Agriculture* deals exhaustively with the "Bird Enemies of the Desert Locust (*Schistocerca gregaria*)" and will no doubt be a useful reference whenever this pest makes its intermittent intensive visits to the desert parts of the Punjab and elsewhere.

The *Bol. Soc. Ent. Arg.* No. 5 is an extremely interesting brochure of some 24 pages, giving, one would say, every possible information upon persons and matters entomological. The National Museum and its activities and future are described. Short accounts of these, both past such as Burmeister, Berg, Brethes, and present such as the two great patrons of aught entomological, the brothers Breyer, Pablo Koehler, R. N. Orjila, etc., and of their work, are given. References to the various exhibitions, conferences, excursions, etc., organised by the entomologists are shortly summarised. In fact everything and everybody directly or indirectly interested in entomology is brought in, and an admirable and one would judge a most useful piece of propaganda has been effected by this most exhaustive dissertation. Entomology cannot fail to be advanced in the public view by such a publication. The illustrations are also interesting to us as among them are two views of the working laboratory of our friend and correspondent Capt. K. J. Hayward.

We regret to hear of the decease of Canon Cabeau, one of the strongest supporters and contributors to *Lambillionia* and its predecessor *Rev. Mens. Namur*.

In the early numbers of *L'Amateur de Pap.* for last year, the late M. J. de Joannis began a most useful series of Analytical Tables of the Pyrales of France and Belgium illustrated with all the necessary figures. The first portion deals with the *Crambidae*. These tables will no doubt enhance the collecting and study of this family as previously there has been no easily obtainable work to which the beginner could turn for help with these moths.

Dr. F. Heydemann of Kiel is doing much intensive study of certain common species of the Macro-lepidoptera illustrating his notes and researches with admirable figures and diagrams. In the *Ent. Zt.* for

March he deals with our old friend *Hydroecia nictitans* under its prior name *oculea*.

The *Int. Ent. Zt.* for March 22nd contains two useful articles :—(1) An account of the breeding of *Gonodontis bidentata* with a plate of some striking forms, and (2) A note on Pierid forms with figures of some extraordinary forms of our three common "whites."

SOCIETIES.

THE ROYAL ENTOMOLOGICAL SOCIETY.—CENTENARY CELEBRATIONS, MAY 3RD.—The Centenary Meeting of the Entomological Society of London was held on the afternoon of May 3rd, 1933, at the Rooms of the Royal Geographical Society, Professor E. B. Poulton, President, in the Chair. The President announced that a message had been received through the Home Secretary that His Majesty the King had ordered that the Society should henceforth be known as the Royal Entomological Society; this announcement was received with acclamation, and it was resolved that an humble message of thanks be sent to His Majesty for this favour. The Secretary (Dr. S. A. Neave), then asked the Society to confer the title of Honorary Life President on Professor E. B. Poulton and his request was acceded to by general acclamation. In a few well-chosen words Professor Poulton acknowledged this testimony of the feelings with which he is regarded by the Fellows of the Society. It may be noted that this honour has previously only been awarded twice in the Society's life-time, to the Rev. W. Kirby and to Professor J. O. Westward. It was then resolved that Commander J. J. Walker, Rev. G. Wheeler and Mr. W. G. Sheldon be elected Special Life Fellows in recognition of their meritorious work on the Council of the Society.

After the admission of several Fellows, the President, in a brief address, referred to the pleasure of welcoming brother Naturalists to this Meeting, and to the function of the Society to promote union amongst all those with a fellow feeling for this branch of Science; there was no need, he said, to refer at length to the History of the Society during the past one hundred years of its life, since an admirable account has already been published; finally, on behalf of the Society, he extended a hearty welcome to all the Delegates.

Sir Peter Chalmers Mitchell, Secretary of the Zoological Society, spoke on behalf of the Delegates from Great Britain and the British Empire. He pointed out that the Zoological Society, which celebrated its Centenary four years ago, and the Entomological Society had evolved on closely parallel lines, both Societies having throughout a century been untrammelled by State aid and forming conspicuous examples of what can be done by a free association of persons united only by a common object. He said that the Delegates had come, not inereely to rejoice with the Society on its Centenary, but to render thanks for all the benefits received from the Society.

Professor P. Lesne, of the Paris Natural History Museum, speaking on behalf of the Delegates from Foreign Countries, felicitated the Society on its Centenary.

The Secretary then read a list of Institutions, etc., which had sent Addresses or congratulatory messages without sending Delegates, and the various Delegates then presented their Addresses to the President.

The Meeting terminated with a vote of thanks to the Royal Geographical Society for the use of their rooms.

On the evening of May 3rd a *Conversazione* took place at 41, Queens Gate, where numerous exhibits were shown in the Meeting Room and in the Library. It would be tedious to catalogue all of these and perhaps invidious to mention only some of those exhibited by private individuals, where all were of the best of their kind and of equal interest. The Society's own exhibit of rare items from its Library included the Obligation Book of the Society from its commencement and original drawings for Plates in the earlier volumes of the Transactions; the original coloured drawings for Stephens' *Illustrations of British Entomology*; the manuscript diary kept by John Curtis, 1840-1854; a copy of Martyn's *Psyche*; and an almost unknown early publication by H. T. Stainton, entitled "Novitates Staintonianae or Catalogue of British Lepidoptera added to the Collection of H. T. Stainton, Esq., in the year 1842, consisting of 103 species."

Dr. C. B. Williams, of the Rothamsted Experimental Station, showed a Light-trap for catching insects, an automatic recording-apparatus for noting the changes in the weight of a beehive, and other exhibits. The Plant Pathological Laboratory, Harpenden, showed enlarged illustrations of several English Insect Pests. The London School of Hygiene and Tropical Medicine exhibited living pupae and adults of *Glossina*, as well as Bed-bugs, Reduviids, Lice, Fleas and Mosquitos, all vectors of diseases, and the Biological Field Station of the Imperial College of Science gave an equally lively exhibit of various insects which attack stored products. The Farnham House Laboratory showed living and preserved specimens of insects utilized for the control of Insect Pests and Weeds.

This *Conversazione* was very well attended—indeed, in the earlier part of the evening it was difficult to get around the Meeting Room to see the individual exhibits—and was undoubtedly a successful close to a very memorable day in the Society's history.—T.B.-F.

REVIEWS AND NOTICES OF BOOKS.

THE HISTORY OF ENTOMOLOGICAL SOCIETY OF LONDON. By Dr. S. A. Neave, F.Z.S., the *Honorary Secretary*, assisted by F. J. Griffin, A.L.A., the *Registrar*, with an Introduction by Prof. E. B. Poulton, F.R.S., *President* and a Financial Chapter by A. F. Hemming, F.Z.S., *Honorary Treasurer*. Published by the Society.—This volume of some 270 pages and 8 plates is not only a faithful and detailed history of the Society from its rise in 1833 to its phenomenal position after the advent of its then great treasurer, Mr. W. G. Sheldon, some 15 years ago, but a record of incidents in the lives of many of the great entomologists of world-wide renown, who have at some period of their lives been enrolled among its members. A perusal of the book shows, as stated in the Preface, that over this long period the Society can justify its claim as stated both in its Bye-Laws and Charter that "it is a Society for the Improvement and Diffusion of Entomological Science." The reminiscences of the President from his entry as a Fellow in 1883, couched in such a charming manner and his references to men who have passed, Darwin, Westwood, Meldola, Trimen, P. H.

Gosse, Verrall, Miss Ormerod, Wallace, Bates, Tutt, Dunning, etc., can be read again and again. This is followed by a succession of chapters each devoted to a period of the Society's existence until in Chapter VII. we come to a most notable decision of the Council, the doubling of the annual subscription and the acquisition of a permanent freehold building for its meetings. Probably there has existed no Society, which has doubled its subscription and at the same time immediately began to increase its membership, and which from the enthusiasm of its members now has extremely fine and artistic quarters, an extensive library of most valuable books and is entirely without debt after spending some thousands of pounds. This chapter is followed by 7 pages of a List of Benefactors. Biographies of 20 distinguished Fellows follow with reproductions of their signatures, and portraits of the Rev. Wm. Kirby and Prof. Obadiah Westwood. The remainder of the volume contains the names of every Fellow since the founding of the Society with particulars of all office they may have held, arranged according to the year of their election. For instance among the first year's "members," as they were then called, we read the names of Babington the botanist, Bell the zoologist, Bowerbank the coleopterist, Children of the British Museum, Curtis, C. Darwin, Doubleday, Gray, Haworth, J. D. Hooker of Kew, Hope the founder of the Hope Museum, Horsfield of Indian fame, Ingpen, Jenyns (Bloomfield), Rev. W. Kirby, Edward Newman, Sir Sydney S. Saunders, W. Wilson Saunders, Shuckard, W. Spence, J. F. Stephens, Swainson, G. R. Waterhouse, Yarrell the ornithologist, etc., a goodly beginning. Lists of Presidents, Hon. Secretaries, Hon. Librarians, Hon. Fellows, Corresponding Fellows, and Special Life Fellows are also recorded. The Frontispiece is a striking portrait of E. B. Poulton, D.Sc., M.A., F.R.S., the President whose attractive personality and personal help in practically every meeting for many years past have been great aids to the enjoyment and instruction at the monthly gatherings. There is a picture of the "Thatched House" Tavern where the meetings were held in 1833, and the room in which they met. The present home at 41, Queen's Gate, is also shown, with two views of the wonderful meeting room, a copy of the famous "Bromley" room in the S. Kensington Museum, the generous gift of Mr. R. Wylie Lloyd. In fact, there is not a page of this "History," which is not of interest to every Fellow of the Society, all of whom owe a debt of gratitude to Dr. Neave the Hon. Secretary whose initiative and wonderful powers of unobtrusively doing aught in the full interests of the Society, has selected and arranged the matter in such perfect sequence. In this work the Secretary especially thanks the Registrar of the Society for the laborious task of collecting the data from all available sources. The issue of this History is a part of the celebration of the Centenary of the Society and will undoubtedly help forward the aim and work of the Council and Fellows as defined in its Charter and Bye-Laws, "the Diffusion of Entomological Science."—Hx.J.T.

THE MOTHS OF SOUTH AFRICA. Vol. I., Sematuridae and Geometridae. By A. J. T. Janse, D.Sc., XII, 37pp., 15plts., 130 text figures. Price 35/-. Durban.—This is the first of a comprehensive series of 10 volumes projected. Some 315 species are dealt with of which 299 are figured as imagines on the plates. The figures in the text are com-

posite often containing 6 to 10 items, nearly all of which deal with the genitalia and venation. There are keys to both genera and species. This is a good and valuable book enhanced, of course, by the aid which L. B. Prout has given the author.

The description and figuring of the genitalia and the venation are among the main features of the work—the terms used in the former are mainly those with which we are familiar in the writings of Burrows and Pierce, much to the gratification of these authors. The figures of the imagines of some 299 species are black and white, but they would have been much more referable if all had been symmetrically placed on the plate. Almost the same difficulty occurs with the 3 plates devoted to genitalia which are unsymmetrically mixed in together. The whole of the text figures of genitalia are lateral views of which the Rev. C. R. N. Burrows has said “the structures must be either mutilated by the removal of one valve or be so obscured by the overlying structure as to be useless.” He goes on to say, “A lot is claimed for the *natural position*. What is the natural position? There are several positions.”

1. “Often the 9th and 10th segments are withdrawn into the preceding 7th and 8th. To snip off the tip of a body here is fatal. I hear that this has been done even with valuable type specimens, with disastrous results.”

2. “The 2 final segments may be extruded, unopened. Here snipping may be safe unless some ancillary portions of the genitalia be situated in the preceding segments.

3. “In action the final segments are extruded *opened*. Here we see everything without mutilation in its proper position—can note readily asymmetry, etc., if present.”

Mr. Burrows expressly says “I stand for the *open book*. I want more than the exposed binding and title, I want to see the inside.”

In the figures which are sketches, it rather obscures the structures to put in the hairs, which are immaterial.

Towards the end of the book there is an omnibus genus in which the author has merged some half a dozen older ones and says of the species, that they show *no structural difference that can be relied on in venation, palpi, legs, antennae, genitalia, etc.* This statement does not seem to be supported by an examination of the figures, where ample differences are readily apparent if only the uncus and valves be examined. And further the figures of the imagines show extraordinary divergence of appearance. Some are like Noctuids, some like “Thorns,” some like other groups, so much divergence indeed as to suggest *mimicry*. When the life-histories of these species are known, they cannot fail to be separated satisfactorily, and it is a pity they have been re-lumped into one genus.

The book is well edited and extremely well produced. It will no doubt prove of inestimable use to future students of the South African Fauna. But whether, in these times of stress, the work will obtain adequate support, we have our doubts. We would largely commend the careful reference to bibliography of species, but would suggest that it would have been more helpful had the original *type* capture been notified.—Hy.J.T.

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EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr. Hy. J. Turner, "Latemar," West Drive, Cheam.

Duplicates.—S. *Andrenaeformis*, Bred 1928, well set on black pins, with data.

Desiderata.—Very numerous British Macro Lepidoptera.—J. W. Woolhouse, Hill House, Frances Street, Chesham, Bucks.

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Duplicates.—*Albimacula**, *sparganii**.

Desiderata.—Ova of D.oo. pupae of X. *gilvago*, D. *caesia*. A. J. Wightman, "Aurago," Bromfields, Pulborough, Sussex.

EXCHANGES.—Living Eggs of *Catocala fraxini* and *sponsa*, exchange for butterflies of British Isles.—C. Zacher, Erfurt, Weimar, Street 13, Germany.

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Desiderata.—*Hyale*, *Welsh aurinia*, *Polychloros*, *Tiphon Agathina*, *Linigera*, *Lucerna*, *Neglecta*, *Diffinis*, *Populeti*, *Gothica v. gothicina*, *White Leporina*, *Tridens Putrescens*, *Littoralis*, *Typhae v. fraterna*, *Rurea v. Combusta*, *Gilvago*, *Fulvago v. flavescens*, *Liturata v. nigrofulvata*. Harold B. Williams, Woodcote, 36, Manorgate Road, Kingston Surrey.

Duplicates.—A large number of species of European and Palaearctic *Rhopalocera* and *Heterocera*.

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Desiderata.—Living larvae or pupae of *Lasiocampa quercus*. Also set specimens of same species taken before 1910 in Devon or Cornwall.

Duplicates.—*Pavonia*, set specimens or living stock: *Monacha*, ova: *oebroleuca*, *griseola*, *advenaria*, *juniperata*, *thetis*, etc.—J. A. Downes, 5, Trinity Road, Wimbledon.

URGENT.—Wanted English (Cumberland) *Erebia epiphron*. Adequate exchange will be made in European Lepidoptera.—B. C. S. Warren, 14, Avenue de l'Eglise Anglaise, Lausanne, Switzerland.

I am seeking an opportunity of exchanging Macro- and Micro-Lepidoptera with English collectors and beg to send list of duplicates.—J. Soffner, Trautenau (Bezirksbehörde), Bohemia, Tschechoslovakische Republik.

CHANGE OF ADDRESS.—T. Bainbrigge Fletcher, R.N., F.L.S., F.Z.S., F.R.E.S., to "Rodborough Fort," Stroud, Glos.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. June 7th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. May 25th, June 8th, 22nd.—Hon. Secretary, S. N. A. Jacobs, "Ditchling," Hayes Lane, Bromley, Kent.

The London Natural History Society.—Meetings first four Tuesdays in the month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through Members, or from the Hon. Sec. A. B. Hornblower, 91, Queen's Road, Buckhurst Hill, Essex.

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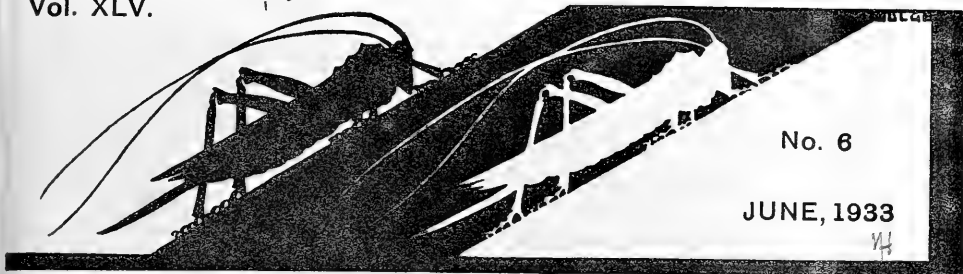
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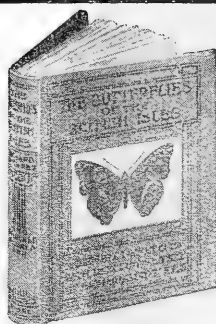
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1



2



3

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NATURAL SIZE



Entomologist's Record.

Plusia moneta. Typical form (1), var. *esmeralda* (2), asymmetrical variety (3).

Below. Enlarged drawings of the "ear" marks of (No. 3).

Plusia moneta, Fab., var. esmeralda, Oberthür. (Plate IV.)⁴.

By P. SIVITER SMITH.

Plusia moneta, Fab. is a common species in gardens at Pebworth, near Stratford-on-Avon, and larvae are not difficult to find in April and early May, feeding chiefly on delphinium. The pale variety described by Oberthür (*Études d'entomologie*, V., pt. 1, p. 85) has not apparently been definitely recorded from anywhere in the British Isles, so that the specimen figured (No. 2) may be of some interest.

It was found resting just inside a window in our house in the summer (I have not the exact date) of 1929. As will be seen in the figure, it is in very good condition, and the difference in tone between this and the typical specimen above it (No. 1) will easily be seen. The illustration is actual size, and the photograph was made on a panchromatic plate, with the light to the left of the camera.

It is really unnecessary to describe the insects, as details are so clearly shown on the plate, but it may briefly be stated as follows:—it is considerably paler than the typical form, having the ground colour of the forewings a yellowish-white tint, with the darker markings lighter in proportion. The hindwings are paler, and this paleness extends over the abdomen, thorax, palpi, antennae, legs, and all the underside.

Mr. H. J. Turner has very kindly confirmed the correctness of my identification. There is a record of var. *esmeralda* in "*Sport and Wild Life in the Deccan*" (1928) by General R. G. Burton, who mentions finding a specimen at Cheltenham, but Mr. Turner thinks that this might be a pale specimen, but not necessarily referable to *esmeralda*. He suggests that Gen. Burton's and other 'pale' British specimens might be called 'trans ad *esmeralda*.' I exhibited my specimen at a meeting of the Entomological Section of the Birmingham Natural History Society not long ago, and at my suggestion further specimens of the species were brought to the next meeting; three of them proved to be var. *esmeralda* with two others approaching the variety. So that probably when attention is called to it, the variety will be found to be of more frequent occurrence than it appears at the moment.

The remaining specimen, No. 3, is a peculiar asymmetrical variety. It was reared by Mr. J. W. Moore, F.R.E.S., at Kings Norton, Birmingham, on July 13th, 1931. The 'ear' mark on the right hand forewing will be found to be very distorted, while the left forewing is quite normal. The lower part of the plate gives enlarged drawings of the 'ear' marks of both forewings of this particular specimen. The whole of the right forewing seems to be different to the left wing, and a few of these peculiarities are discernible in fig. 3. Other specimens bred at the same time were quite normal. Mr. Moore very kindly gave me the insect. I have submitted it to Dr. Cockayne, but, as he says, it is almost impossible to speculate on its nature. [I have compared the insect with the figure of *esmeralda* in Seitz, *Pal. Noct.* III. pl. 65i and find it exactly similar in colour and marking.—Hy.J.T.]

Donegal in August.

By REV. CANON FOSTER, B.D.

For the last three years I have spent the month of August in Co. Donegal, and have devoted that part of my time, which was not taken up with fishing, to entomology, and I found it a most interesting district. In 1930 I stayed at Portnoo and Marin out on the west coast. Donegal town was my habitat for 1931, while August, 1932, saw me at Gartan, inland, about the east centre of the county. Of the three localities Portnoo and Gartan were the most productive, though some exceedingly interesting micros turned up at Donegal and there the Hymenoptera were quite rich and varied.

Portnoo lies on the S. side of Giveebura Bay and has an amazingly fine outlook over sea and mountain, North, East, and West. South there is a maze of heather clad hills and lakes, where the heather is deep and brushwood such as juniper, willow and birch abundant. To the East there are vast stretches of sandhills and marsh lands backed by rocky hills clad with wood. The nightwork on the sands and marsh was most entrancing. On the ragweeds there was an endless number of *Agrotis tritici* in extraordinary variety; then *Hydroecia crinanensis* was most abundant, nearly every ragweed displaying numerous specimens along with a few of *H. lucens*. *Agrotis praecox* was also fairly abundant, while *A. cursoria* of great size and beauty was the least frequent. *Polia chi* was rather scarce. Another moth that was most tempting owing to its splendid condition and plenty was *Apamea leucostigma* including grand specimens of *fibrosa*.

Though the work on the moors was not so thrilling as that on the sandhills, the specimens being much scarcer and scattered over miles of heather with odd ragweed, yet the net results were excellent. *H. lucens* appeared again; but perhaps the most interesting capture was that of *Gnophos myrtillata*. There are only two other confirmed Irish captures for *G. myrtillata*, namely Dowros Head, Donegal, and Clare Island, Co. Mayo. It was netted as it was flying gently along a heathery bank one night close to Pound Lough. Along the shores of the other lakes such as L. Doon, where juniper is abundant, *Thera cognata* was to be captured flying at night, or the caterpillar could be beaten out by day. At the same time *Eupithecia sobrinata* was often abundant on the wing. But I could see no signs of *Thera juniperata*.

August, 1930, was very wet in Donegal, especially the nights, with the result that night after night no work could be done. August, 1931, was spent at Donegal Town. Here the results, especially of night work, were very disappointing. Owing to the geological strata there is no heather, and the rush grown fields with any amount of alder were not productive. But half way to Pettigo one got into the heather again and *Coenonympha tiphon*, Rott., was fairly abundant at the beginning of the month. The harbour and estuary at Donegal town is just slob without any sandhills for a couple of miles down. There work no doubt would have been fruitful at night, but the question of getting back up the estuary at midnight was the difficulty. Except therefore for some interesting Tortrices and Tineina the 1931 visit to the county was poor in results. August, 1932, was spent near Gartan Lake about the centre of the county. Owing to reasons of health very little night work could be done, yet the day work was deeply interesting. Numbers of

caterpillars turned up with beating and the Tortrices were very abundant. Gartan Lake lies in a great cleft among the mountains and is well wooded; there is also splendid heather. Near at hand, too, lies Glenveagh, a marvellous cleft, miles in length, through the mountains occupied by Glenveagh Lake. However, this was barely touched, although it seems full of promise.

These three districts appear to vary in an extraordinary way as regards vegetation. Around Portnoo poplar and juniper were abundant, neither of which have I seen before really native in this county, except for a little juniper on cliffs in Kerry. But neither of these were to be seen at Donegal town or Gartan Lake. Botanically therefore Portnoo seemed the richest locality, and this was reflected in the fauna. But the oak and birch woods around Gartan were most fascinating, yet they require a resident fully to explore their resources.

Amorpha populi, L.—Ova and caterpillars abundant everywhere, both on poplar and willow.

Dicranura vinula, L.—Was especially abundant at Portnoo, both on the black poplar and also on the willow bushes growing among the heather. My son reports the caterpillars as quite a good bait for trout!

Pheosia tremula, Cl.—The caterpillar was abundant at Portnoo on the poplar, but I never found it on willow.

Lophopteryx camolina, L.—Gartan, on birch.

Notodonta ziczac, L.—Gartan and Portnoo, on willow.

N. dromedarius, L.—Portnoo, Gartan, abundant on birch.

Drepana lacertinaria, L.—Was very abundant all around Gartan in the larval stage on birch.

Phalera bucephala, L.—Gartan, caterpillar abundant.

Pygaera pigra, Hufn.—A feature of the Donegal hills is the extraordinary abundance of the larva on practically every low-growing species of willows. This was so everywhere I worked. Sometimes you would find a bush full of their empty tabernacles, and you would discover in the end the big spider, which no doubt was accountable for their disappearance. But I find them very hard to rear; they turn into pupae all right, but very few emerge. I was hopeful that I had also secured *P. curtula*, but it failed altogether to emerge, even if my identification was correct.

Palimpsestis or, Fabr.—Aspen is another shrub occurring around Portnoo and less commonly at Gartan. A huge rock hung out over a lake near Dungloe and at its foot grew an aspen. This was full of the fastened leaves containing the larvae of *P. or*. I regret that for fastidious reasons (they seemed such dirty creatures!), I took but few, and I have not met with it since though exploring every aspen I could get at.

Orygia antiqua, L.—The “vapourer,” though generally distributed, is mostly scarce in Ireland, but a male specimen emerged September 2nd bred from a caterpillar found at Portnoo. At Gartan the males were occasionally to be seen flying wildly around birch trees in the daytime.

Macrothylacia rubi, L.—The caterpillar was very abundant at Portnoo and Dungloe in 1930, but was scarcer at Gartan in 1932. I did not notice it at all around Donegal town in 1931.

Saturnia pavonia, L.—Caterpillar on heather, Portnoo.

(To be concluded.)

Paris and Mouthier (Doubs.) in July-August, 1932.

By LIEUT. E. B. ASHBY, F.E.S., F.Z.S.

Leaving London on July 15th, I arrived in Paris early the next morning, and I put up for the 5th International Congress week at the Hotel D'Albret in the Rue Baudin.

In the afternoon of the 16th, the plenary session of the centenary of the Entomological Society of France took place at 3 p.m. in the large amphitheatre of the National Natural History Museum, in the presence of the President of the French Republic, and under the honorary presidency of Mons. A. de Monzie, Minister of National Education.

It was extremely hot in the building, and there was a large audience. Dr. Jeannel of Toulouse made a fine opening speech and perhaps the most interesting features of the afternoon were the presentations to the Entomological Society of France of the congratulatory addresses re the centenary from a large number of Universities and other learned bodies from all parts of the world. A good musical programme was followed out after the President of the Republic had left. At 8 p.m. the same day a Banquet took place at Claridge's Hotel given by the Entomological Society of France to about 378 delegates from about 39 countries of the world. This dinner was very enjoyable, and after Dr. Jeannel had spoken, Professor Poulton voiced the appreciation of all present in a particularly well worded speech.

July 17th. Visit to the tomb of Latreille in the cemetery of Père-Lachaise at 10 a.m. In the afternoon took place the Excursion to Chantilly by autocars. The Chateau and the Forest were visited.

The morning of July 18th I took an early train from the Gare de l'Est to the Station of Ozoir-la-ferrière where I collected for the day in the forest of Armainvilliers. I had lunch at Pontcarré which village had grown somewhat since my last visit. Between Ozoir-la-ferrière station and Pontcarré I got the following insects, viz., *L. sibilla*, *Apatura ilia* 1 ♂, *Aphantopus hyperantus*, and *Epinephle tithonus*, also 8 males and 1 female, in fair condition of the skipper *Heteropterus morpheus*. This forest, being very damp, is probably very suitable for the last insect which seems locally plentiful in a part of the forest where reeds abound. I regret I cannot describe the locality of about 100 yards, where I found it, a map being necessary.

July 18th was the Opening Session of the 5th Congress of Entomology in the large amphitheatre of the Institut National Agronomique, 16 Rue Claude-Bernard, under the presidency of honour of Mons. A. Gardey, Minister of Agriculture.

This meeting was extremely well attended.

At 5 p.m. a visit took place to the Entomological Laboratory, at the Natural History Museum, 45 bis rue de Buffon. From 2 p.m. to-day until mid-day on July 23rd, sectional meetings of the Congress took place at the Institut Agronomique in morning and afternoon apart from excursion days.

July 19th. A Reception took place by the municipality of Paris in the fine rooms of the Hôtel de Ville at 5 p.m., where the beautiful mural decorations were much admired by the Congressists.

I was again in the Forest of Armainvilliers to-day at Ozoir-la-ferrière and took a series of 18 specimens of *Heteropterus morpheus*, in the same locality as on July 17th, together with a fair specimen of the

moth *Drepana falcataria* and a few specimens of *Melanargia galathea* and *Polygonia c-album*.

July 20th. Excursion of the Congress to the Forest of Fontainebleau. The cars left 16 rue Claude-Bernard at 9.30 a.m., and after passing through a part of the old fortifications of Paris (which are rapidly disappearing) proceeded by way of Corbeil, and the Valley of the Seine to Barbizon, one or two short halts at interesting points being made en route.

Barbizon is a very good collecting part of the forest, the village being still small, and there is a lot of good varied ground in the vicinity.

Since I first visited the Chateau at Fontainebleau in 1910, the town has grown considerably and it takes longer than formerly to get out into good collecting ground. Mr. Bainbrigge Fletcher showed me 4 specimens of the Skipper Butterfly *Heteropterus morphews* that he took to-day in this Forest mostly on heather. The New Forest would only occupy a comparatively small portion of the Forest of Fontainebleau which is the largest in France. On the way to Fontainebleau we passed the Forêt de Senart, on the left. Other good forests similarly situated in the environs of Paris, are Senlis, Bondy, Montmorency, Chantilly, St. Germain, Armainvilliers, Ermenonville, Compiègne, and this does not exhaust the list. The return to Paris was by way of Melun.

July 21st. After an afternoon visit to the vivarium near the Natural History Museum, which proved very interesting, a Banquet took place in the evening at the Zoological Gardens at Vincennes given by the Ent. Soc. of France to the Congressists. The function was very well attended by a large number of Entomologists; before dinner we had an opportunity of walking around part of the Gardens.

July 22nd. To-day after morning sessions of the Conference the excursion took place to Versailles and the Valley of the Chevreuse.

July 23rd. The Final Meeting of the Conference took place this afternoon at 3 p.m. in the grand Amphitheatre of the Institut Agronomique. The President of the Congress, Mons. P. Marchal, Membre de l'Institut, in the Chair. The meeting was very well attended and all present were much interested in a cinematograph lecture on Bee Culture by a German lady Member. It was announced that the proposed International Centre for Entomology had been abandoned indefinitely. There followed a short resumé on the work of the sections and the Report of the secretary of the permanent executive committee, presented by Dr. Jordan, who interested us extremely well in English, French and German. A short report of the Committee on Nomenclature preceded the discussion on the choice of the date and place of the 6th next International Congress.

After Germany and Egypt had been mentioned by their respective advocates, Señor Bolivar, Junr., of Madrid, so well advocated the claims of Spain, that on a vote it was decided by the meeting that the next Congress should take place at Madrid in 1935, Señor Bolivar, Senr., of the Madrid Museum being elected President, which last fact was well applauded.

The Congress closed with the speech of the President, Mons. P. Marchal, which was much appreciated.

(To be continued.)

The Mystery of "The Little Black"
(*Chrysoclista atra*, Haworth.—Lep., Cosmopterygidae.)

By T. BAINBRIGGE FLETCHER, F.L.S., F.R.E.S., F.Z.S.,
 and H. STRINGER.

We trust, gentle reader, that our title has not led you to expect anything in the way of a Crime Club "thriller." We have merely tried to elucidate the identity of the small moth described by Haworth under the name of "*Recurvaria atra* (The little Black)" in 1828, since which date it never seems to have been identified satisfactorily by any author owing to confusion with two or three allied forms.

Haworth's description (*Lep. Brit.*, pp. 553-554, 1828) is brief and vague and, after a remark that the species varies, it is further complicated by the fact that he proceeds to give three separate descriptions under the letters α , β , and γ . It is very fortunate that Haworth's three original specimens are still preserved in the British Museum (Natural History), to which they were transferred in 1863 on the incorporation of Haworth's Collection contained in the Entomological Society's Collection. Examination of these three specimens shows that α and β are conspecific, although Haworth expressed a doubt ("An distincta species?") of their identity, and are examples of the apple-feeding species; of γ there remains only the basal portion of one forewing and it is impossible to say definitely from the specimen what it really was, but so far as can be judged from the remains of the specimen and from Haworth's description it was an example of the species later described by Duponchel as *hellerebella*. It may be added that Haworth in his description cites, with a query, "*Tinea exiguella*, Hub. *Schmet. Tin.* 39, 266 and Fab. *Ent. Syst.* 3, 328, 179" as possibly the same as his species *atra*; as regards this point, the Fabrician description does not seem to be identifiable at present and Hübner's figure 266 (*Tinea exiguella*) does not agree with any of the forms at present under consideration; it is not referred to in Rebel's *Catalogue* (1901) and does not appear to have been identified. Werneburg (*Beitr. Schmett.* I., 482-483 and note 411 on p. 582; 1864) considered that *exiguella* was perhaps the same as *Elachista cingilella*, H.-S. It may be noted that *exiguella* was originally described in *Wien. Verz.*, and not by Fabricius.

In 1829 (July 15th,) Stephens, in his *Catalogue of British Insects* (p. 197, no. 7210), placed *atra*, Hw., under the generic name *Anacampsis*, Curtis, and added, with a query, references to *Tinea exiguella*, Fabricius and Hübner.

In 1834 (September 30th,) Stephens redescribed *Anacampsis atra* in his *Illustrations of British Entomology*, Haustellata IV, 213-214, referring especially to "Re. *atra*, β , Haworth," thereby fixing Haworth's specimen β as the type of *atra*, Hw. From his description, however, it is evident that he had a mixture of species before him, as he states that "Some examples are of a paler, others of a darker, hue, with the colours more contrasted."

In 1837 Wood, in his *Index Entomologicus*, figured (t. 39, f. 1220; 1. iii. 1837) and mentioned (p. 177; 1. VI. 1837) a species under the name of *Anacampsis atra* with a reference to Stephen's Haustellata and a repetition of his localities, but Wood's figure, which is a good one, is

evidently not of *atra*, Haw., but of *hellerella*, Dup., "of whom next," as the genealogists put it.

Duponchel, in his *Hist. Nat. Lep. France*, XI, 218-219, t. 293, f. 11, described and figured a single specimen from the Département du Nord under the name of *Alucita hellerella*. In this case also we have been fortunate, as the British Museum (Natural History) possesses the original water-colour drawings for Duponchel's plates and reference to this original figure shows that his type of *hellerella* was distinct from *atra*, Hw., and identical with the common hawthorn-feeder. The date of publication of this portion of Duponchel's book is not certain but may be taken to be at the end of 1838.

In March 1839 Zeller (*Isis*, XXXII, 211) published the description of *Elachista putripennella*, a name which he ascribed to Fischer von Röslerstamm. The latter, however, does not seem to have published any description under this name and probably merely gave a manuscript name to Zeller, who was the first to authenticate it. Zeller's description was made from nine specimens from Bohemia and Prussian Poland, and once again the British Museum (Natural History) is fortunate in the possession of the Zeller collection, which includes a specimen labelled as the type of *putripennella*, Zeller. This species comes very close to *hellerella*, Dup., from which it is distinguishable by the basal third of the dorsal area of the forewing being distinctly yellow (white in *hellerella*). Whether *putripennella* is specifically distinct from *hellerella* we are at present doubtful. All the Continental examples in the British Museum Collection, from Central Europe, are separable on this colour-character from British specimens of *hellerella*, but it is possible that *putripennella* and *hellerella* are merely eastern and western forms of a single species. We have seen no material from the Continent of Western Europe, where the two forms may meet. The late Abbé de Johannis, however, has stated (*Ann. Soc. Ent. France*, LXXXIV, 98; 1915) that *putripennella* appears to be distinct from *hellerella*; and so, for the present, pending examination of further material, it seems advisable to keep these two forms as separate species.

Curtis, in his *British Entomology*, XVI, page [2] of the explanation of Plate 735 (April 1839), was the next author who referred to *atra*, Haw., which he redescribed briefly and placed in his new genus *Laverna* (type *ochraceella*, Curtis). His description seems to include *hellerella*, Dup., as well as *atra*, Hw.

Westwood, in his *British Moths*, II., 190, t. 106 f. 6, (dated 1845 on title-page but perhaps published earlier in parts) redescribes and figures *Anacampsis atra*, Hw., quoting *Tinea exiguella*, Fb., Hb., as a synonym. His description seems to include *atra*, Hw., and *hellerella*, Dup., but his figure, which appears to be original (and not copied from Wood, as so many of them are) represents a species with red-brown wings and two distinct red-brown spots on the edge of the white streak (apparently *hellerella*, Dup.).

In 1854 Herrich-Schäffer (*Schmett. Eur. V.*, 214, t. 119, f. 974) described and figured a new species as *Tebenna vinolentella* from specimens received from H. Metzner who found them on vine-stems at Frankfurt-on-the-Oder in July. This species, so far as we know at present, seems to be confined to Germany and we only mention it here as it has been introduced erroneously into the British list.

In the same volume (p. 214, t. 119, f. 976) Herrich-Schäffer

redescribed and figured *Tebenna putripennella*, ascribing this name to Fischer von Röslerstamm but quoting Zeller's *Isis* paper and sinking *atra* var., Hw., and *hellerella*, Dup., as synonyms. This description applies to *putripennella*, Zeller, which, as we have already noted, is perhaps distinct from *hellerella*, Dup.

In the latter half of 1854 Stainton (*Ins. Brit. Tin.* pp. 239-240, t. ff. 8''' [neururation of Fw. and Hw.]) gave a detailed redescription of *Laverna atra*, Hw., under which name he quoted *hellerella*, Dup., and *putripennella*, Zell., as synonyms. His main description is of *hellerella*, Dup., but he recognized that his material contained probably more than one species as he remarks "(In some specimens the anterior wings are almost entirely suffused with black, and the head, face, and palpi are also darker) . . . the dark variety appears exclusively attached to the apple, it is possible it may be a distinct species." Further evidence regarding this possibility reached Stainton in August, 1854, as we read on page 13 of the "*First Annual Supplement to Insecta Brit. Tineina*" (issued for gratuitous distribution under date 1. XII. 1854 and reprinted in *Entom. Annual* for 1855, p. 55) that Mr. E. Brown had bred this dark variety of *Laverna atra* from apple shoots and had never seen a light variety among the many scores caught and bred from these trees, which Stainton notes as being "in confirmation of the idea that the dark variety may be a distinct species." Stainton, however, did not follow up this clue, as we find in his *Manual* (II., 399, fig.; 1, VI. 1859) that he briefly redescribed and figured *hellerella*, Dup., under the name of *Laverna atra*, merely remarking that "sometimes the fw. are entirely black, but this may prove a distinct species," and noting without further comment the larval distinctions as:—"Larva [*hellerella*] in hawthorn-berries IX; (the black var. [*atra*] in budding shoots of apple II, III)." And there, apparently, Stainton left the matter without further elucidation, although one would have thought that the differences in larval habits would have put him on the right track.

In 1860 Frey published a paper, "Das Elachistiden-Geschlecht *Laverna*," in *Linnaea Entomologica*, XIV., 180-205. On pages 198-199 he redescribes a species which he calls *Laverna atra*, Hw., quoting *hellerella*, Dup., and *putripennella*, Zeller (which he also ascribes to F.R.), as synonyms; this description apparently applies best to *putripennella*. On page 199 he also refers to *L. vinolentella*, which, however, he only knew from Herrich-Schäffer's description and figure.

In 1876 Wocke, in Heinemann's *Schmett. Deutschl.* II., ii. 429, gave a redescription under the name of *Blastodacna hellerella*, quoting as synonyms *atra*, Frey, Stainton, and *putripennella*, Zeller, Herrich-Schäffer. This description applies best to *putripennella*, Zeller. On pages 429-430 of the same volume he re-describes *Blastodacna vinolentella*, H.-S., stating that the larva is attached to apple.

In 1880 Frey (*Lep. Schweiz.* pp. 403-404) records "*Laverna atra*, Hw.," from St. Gallen and Degersheim, quoting *hellerella*, Dup., and *putripennella*, F.R., as synonyms, and stating that the larva lives on apple stems and in *Crataegus* fruits. It is probable that this record is referable to *putripennella*, Zell., but we have seen no Swiss material.

In 1895 Meyrick (*Handbook*, p. 678) separated the apple-feeder from the hawthorn-feeder but unfortunately used the names *vinolentella*,

H.-S., for the former and "*atra*, Hw., (*hellerella*, Dup.)" for the latter, including both in the genus *Chrysoclista*, Stainton.

We may omit quotation of the citations in Rebel's *Cat. Pal. Lep.* (1901) as these have already been dealt with as they occurred.

In 1910 Spuler (Schmett. Eur. II. 387) dealt with the species of this group, under the generic name *Blastodacna*. Omitting any reference to the name *atra*, Hw., he redescribed *putripennella*, Zeller, figured it (t. 89 f. 60), gave its occurrence as Sweden, S. Norway, Livonia, Central Europe, S. France, Italy and Dalmatia, and redescribed the larva as found on apple; this reference applies to *putripennella*, Zell. Under the name *hellerella*, Dup., he gave a short diagnosis in comparison with *putripennella*, noted its occurrence from S. Norway and Livonia throughout Central Europe to S. France, Italy and Dalmatia and redescribed the larva as found in fruits of *Crataegus*; this reference applies to *hellerella*, Dup. Under the name *vinolentella*, H.-S., he also gave a short redescription and stated its area of occurrence to be Central Germany and England, but without any note of the larva or foodplant; this reference applies to *vinolentella*, except as regards its occurrence in England. We do not know whether Spuler's records of occurrence of the other two species were based on actual material which he had seen or were merely taken from literature; in the latter case, they may require some modification.

In 1928 Meyrick again dealt with the two British species (*Rev. Handbook* p. 654) and, as in 1895, applied the names *Chrysoclista atra*, Hw., (*hellerella*, Dup.) to the hawthorn-feeder and *C. vinolentella*, H.-S., to the apple-feeder.

In 1930 Mrs. M. Miles described the life-history of the apple-feeder (*Ann. Appl. Biol.* XVII., 775-795) under the name of *Blastodaena atra*, Hw., and in 1932 that of the hawthorn-feeder under the name of *Chrysoclista* sp., (*North-Western Naturalist*, VII. 294-298).

In the foregoing review of the literature on these species we have gone over the principal authorities affecting their nomenclature, but do not claim to have quoted every published reference, as our main object was to discover the names correctly referable to the species concerned. Of these there appear to be four (or three, if *hellerella* and *putripennella* are not really distinct species), which may be separated as follows:—

1. Palpus dark (banding not conspicuous); Fw. with distinct yellowish transverse costal streak at about $\frac{3}{4}$.
 vinolentella, H.-S. (not British).
 Palpus conspicuously banded whitish and blackish; Fw. without distinct yellowish transverse costal streak at about $\frac{3}{4}$.
 atra, Hw. (apple-feeder).
2. Fw. almost unicolorous dark fuscous (sometimes with orange streaks); dorsal area towards base not conspicuously lighter.
 putripennella, Z.
3. Dorsal area Fw. more or less yellowish. *hellerebella*, Dup.

The above descriptions are, of course, merely based on superficial colour-characters. We have not gone into the question of the generic

characters, as this would require a more extensive examination of these and numerous other species. For the present, therefore, we are content to leave all these species under the generic name *Chrysoclista*, of which *Blastodacna* may be considered a synonym.

As regards the distribution of these four species (or forms);

- (1) *C. vinolentella*, H.-S., seems to be known only from Germany. We have seen no British specimens and this name must be removed from the British List.
- (2) *C. atra*, Hw., is a British species, but not exclusively so, although it does not seem to be recognized on the Continent. The only Continental specimen which we have seen is one labelled "Paris, e.l. *Lyrys malus*," in the Frey Collection. *C. atra*, therefore, occurs in the North of France but it is doubtful if it is found further East or South.
- (3) *C. putripennella*, Zell., (whether a distinct species or a form of *hellerella*) seems to be exclusively Continental, most of the specimens which we have seen being from Germany.
- (4) *C. hellerella*, Dup., occurs in England and was originally described from France, but does not seem to be found further East, unless *putripennella* is an Eastern form of it. Further specimens from France, Holland and Belgium are desiderata at present; meanwhile it seems better to keep *hellerella* and *putripennella* as distinct species.

So far as the two British species are concerned it is sufficient to remember that A stands for *atra* and apple, whilst H stands for *hellerella* and hawthorn.

Zygaenae, Grypocera and Rhopalocera of the Cottian Alps compared with other races.

By ROGER VERITY, M.D.

(Continued from Vol. XLIV.; p. 142.)

Boloria amathusia, Esp., race *titania*, Esp. (nec Hüb.):—Oulx (beginning of June to beginning of July); Cesana (11th and 24th of July); Clavières (29th of July).—There is some confusion in connection with the name of this race, owing to the fact that Esper and Hübner received this species from Piedmont under the name of *titania* and both published it nearly simultaneously, so that it is not possible to establish with certainty which of the two has right of priority: Esper's Supplement, which contains it at page 58, cannot have been published till after 1798, because at page 89 there is a reference to de Pruuner's *Lepidoptera Pedemontana*; Esper states his specimen came from Sardinia, but he evidently confused the kingdom of Sardinia with the island of Sardinia, which was part of it, but whence his *amathusia* certainly did not come. His figure of a female, although it is extremely rough, unmistakably represents the very distinct race proper to the Piedmontese or eastern watershed of the Western Alps: small size, pale, yellowish fulvous, extremely thin black markings on both surfaces, which are particularly faint on the underside of the forewings; light and broadly sulphur-yellow underside of hindwings. According to localities this characteristic form is found mixed with a variable proportion of the less extreme *serena*, Frühstorfer, described

from the Valais, and notably from Zermatt and the Simplon, and from the hottest valleys of the Upper Adige (S. Tyrol). At Clavières, at 1800m., large numbers of *titania* were flying alone; at Cesana, 1800m., and at Oulx, 1000m., transitions to *serena* and a few actual *serena* were met with by me; at the Baths of Valdieri, 1400m., in the Maritime Alps, which are damper, the race could, on the whole, only be called *serena*, and *titania* was found as an extreme individual variation.

In our *Faunula Valderiensis* (Bull. Soc. Ent. Ital., 1911) Turati and I had applied the name of *titania*, Hüb., to the latter race, pointing out it had precedence over *serena*, Frühst., a female of which it represents. We did not know, at the time, of the existence of Esper's *titania*, to whose form and race it must be taken Frühstorfer has unconsciously restricted the name by erecting his *serena*, unless it can be proved that Hübner had precedence over Esper, and this is very unlikely to happen, as the latter has, on the contrary, more probabilities in his favour (according to Fernald's and Hemming's conclusions, the date of Hübner's figure, for purposes of priority, is 1799). It is noteworthy that the race of *amathusia* which resembles *titania*, Esp., most is the distant *altaica*, Seitz, of Siberia. At Cesana I found quite a number of extraordinarily small individuals, with very pale colours on both surfaces and minute black streaks, which might well be distinguished under the name of **microtitania** (length of forewing in the males 17 to 18mm., against the average 19 to 20 of *titania* and 20 to 22 of *serena*, but appearing still smaller on account of the narrowness of their wings). It can also be remarked that there is a sharp contrast between the Italian *titania* and the race of high altitudes on the French or western watershed, which Frühstorfer has named *pralognana*, from Pralognan 1400-1500m.; it is not as small and pale as *titania* and the markings, especially on the outer part of the wings, are very heavy.

Argynnis ino, Rott. (= *dictynna*, Schiffermüller) race *adula*, Frhst.: Oulx (quite worn at Villant on July 17th); Cesana (males from July 11th to 24th; females emerging on August 1st); Clavières (on July 29th only some worn males were found).—All these specimens belong to the form in which the fulvous is of a clear, bright and rather yellowish tone and the black pattern is distinctly thin, including the narrow marginal one. The females I have met with are not of the lightest form, resembling the male sex most, but are of a deeper tinge of fulvous, with a slight violet sheen, and have quite an average amount of black suffusion on the basal portion of both fore- and hind-wing. The underside of both sexes is rather of the light sort of colouring, with considerably broad yellow areas. These features are quite constant, and confer a characteristic aspect to the race, which exactly resembles my specimens from the Engadine and corresponds to Frühstorfer's description of race *adula* from the latter locality, so that no other name could be applied to it. All the specimens I have from Geneva (Versoix) correspond to this race too.

What I cannot understand at all are that author's remarks concerning his race *eporedia* from "Courmajeur, Cogne (Piedmont) and S. Tyrol." (In a letter to me he told me he had found this species at Atzwang, near Bolzano, if he well remembered, but there seemed to be some doubt about it). The statement he makes in his

description of *eporedia* is that "transalpine specimens have a broader black marginal border to all the wings and nearly doubly as broad a median band in both sexes as those from nearly the whole of Germany, Vienna and Hungary." In discussing the validity of the specific names of *ino*, Rottemburg, and *dictynna*, Schiffermüller, of this species in the *Ent. Rec.* of 1930, p. 152, I pointed out that Rottemburg's figure exactly represents the individual form which is prevalent at Vienna, with rather a broad black marginal band on the upperside and a purple suffusion of a deep tinge on the underside. This nominotypical form is about the darkest produced normally by the species, so that the description of *eporedia*, becomes incomprehensible, if compared with it, but one does not gain much by attempting to compare it with series of examples from Northern Germany, for, there, one finds an enormous variability and the darkest forms mixed with some which are exactly like *adula*. Frübstorfer also adds that "the females of *eporedia* lack the bluish-grey suffusion and that the basal portion of the hindwings is quite insignificantly suffused with black." Besides the fact that this feature is associated with a thin black pattern, as a general rule, in all the *Argynnidi*, so that it sounds somewhat contradictory to the first part of the description, it happens that the females I possess from the Pertud, just above Courmajeur, are amongst the darkest I have seen and have a distinct violet sheen and the whole basal half of the wings covered with black scaling; the black markings, on the other hand, are not in the least particularly large.

The race I have collected at Santo Stefano di Cadore, 900m., in the Carnic Alps, corresponds to the nominotypical form. My specimens from Estonia and one from Norrviken, in Central Sweden, answer Frübstorfer's description of race *tergesta* very well. The most distinct European race is that of the high mountains of Aragon, described from Orihuela, 1700m, as *erilda*, Sagarra: small and often very small size; fulvous of quite a peculiar, very clear, yellowish tone; black markings, on an average, thinner than in *adula* and basal suffusion, especially, very much lighter in tone and less extensive than in any other European race; the underside, on the contrary, differs much less from *adula* than one might have expected from the look of the upperside, if one did not remember that this contrast between the two surfaces is a feature of Iberic races and becomes particularly pronounced in those species which have a Southern, or Africo-Iberic, Exerge, like *M. didyma* and, probably, *A. hecate*. In *ino* there is evidently no such thing, so that that feature, acquired in Aragon, is only exhibited to a slight degree. It is one of the remarkable species, which are restricted to the Northern Zone and which have scarcely succeeded in spreading on the southern, Italian, watershed of the Alps, but which have done so, through Northern and Western France, into Northern Spain and, in this case, even as far as Aragon at very high altitudes.

As we are dealing with *ino* I must note that my materials from Asia answer quite well to the descriptions of the various perfectly distinct races, which have been published, but I find one of the most extreme and striking ones has been overlooked. A little series of it has been sent to me by Bang-Haas under the entirely wrong name of *sibirica* and labelled: "Chinese Turkestan, Thianchan mont. or., Juldus Tal, 2500m., Juli." In reality it is a very much further degree of variation in the same direction as *clara*, Stdgr. (renamed *achasis*,

Frhst., on account of homonymy in this genus) from the Kentei Mts. One can consider *clara* to be the lightly coloured and marked Asiatic form corresponding to the European *adula*, whereas *sibirica*, Seitz, corresponds to the nominotypical *ino*. As in Europe, the two can be racial in some localities or exist together, and be simply extreme individual variations, in others; in the latter case, the name of *clara* can perfectly well be used for the light form. Now, the Yulduz race, mentioned above, stands to *clara* exactly as race *erilda* stands to *adula*: it is smaller (length of forewing 19 to 20, against 22, or more, in the male and 21 to 22, against 24, or more, in the female); the fulvous is even lighter and more yellowish than in *erilda*; the black markings still thinner and very much so in the female; the basal suffusion nearly entirely effaced; underside colours and patterns correspondingly light and reduced, to a degree no other race or form exhibits, all the russet being replaced by a very pale yellowish chestnut. I name this race **asiaepallens**, n. nov. It evidently corresponds to the *generator*, Stdgr., of *Boloria pales* from the same region.

(To be continued)

NOTES ON COLLECTING, etc.

EVERES ARGIADES AND E. ALCETAS.—These two species were definitely separated in Tutt's *Natural History of the British Lepidoptera*, Vol. III., but I am not aware that the two species have hitherto been recorded as flying together. This however occurred to me this month (May) in one of the fields just beyond the Abbey of Hautecombe on the West side of the Lac de Bourget. Unfortunately the time between the arrival and departure of the boat from Aix is very limited, and the wet weather which prevailed during the last week of my stay made further investigation impossible. Consequently I only took one ♂ and one ♀ of *argiades* though *alcetas* was very plentiful. The two are quite distinguishable even on the wing, *argiades* being slightly the larger. The specimens of the 2nd generation of *alcetas* taken formerly at Chindrieux, on the other side of the lake, are on the other hand at least as large as the spring form of *argiades*. The ♀s are very different, that of *alcetas* is entirely brown, while the specimen of *argiades* taken this year has a much blacker ground and shows a considerable amount of blue on the disc both of the fore- and hindwings and a row of black spots at the border of the latter, edged internally with the blue of the male.—(Rev.) G. WHEELER, M.A., F.R.E.S., F.Z.S.

QUEEN WASP AND E. CARDAMINES.—In my garden I have a big patch of *Cardamine* to attract the "orange tip" ladies to lay their eggs on. I also collect paired individuals and place them on this patch in the evening at sunset. In the past I have noticed that a great many of these disappeared mysteriously on days when there was no sun to induce them to fly away when separated, so I determined to watch a pair and see what happened. This morning I found a pair about ten o'clock s.t. and brought them to my patch; for some time nothing happened, I went to another part of the garden, and when I came back, the culprit was at work, a *Vespa*. It had almost demolished the ♂ when I arrived; the ♀ had fortunately separated. I have

several times observed wasps pouncing upon Geometers at rest on leaves, and devouring them but I would not believe that they would attack *E. cardamines*, which is so well protected by its cryptic coloration when at rest.—THOMAS GREER, "Milton," Sandholes, Dungannon, Co. Tyrone, May, 8th. [The *Vespa* sent was kindly identified by Mr. K. G. Blair of the B.M. as *V. sylvestris*.—Hy.J.T.]

CURRENT NOTES AND SHORT NOTICES.

We have received the following personal separates which have not yet been acknowledged.

LEPIDOPTEROS ARGENTINOS. Family *Hesperiidae*. By Capt. K. J. Hayward, F.R.E.S., F.R.G.S., F.Z.S.—After dealing with the Nymphaline family our friend has taken up the family which is often the last to be treated. He has contributed to the *Revista Soc. Ent. Argentina* an account of the first of the three subfamilies, the *Pyrrhopyginae*. He has followed Mabille in the *Cat. Lep.* IX. (1912) with the nine genera and fourteen species found in the country so far, including two new species, a *Pyrrhopyge*, *P. ruficaudi* and an *Oxyetra*, *O. rufocincta*, both taken in one of the border regions, Misiones. The subfamilies and genera are each dealt with and a few references given. The species are described with references and localities. There is a useful plate of venation, another plate in black and white contains a figure of each of the species described. One would like to have seen the names of the two new species in the usual conventional Clarendon type.

In a subsequent number of the *Revista* the second family, the *Pyrginae* is commenced; fifteen genera and fifty species, the first section, are treated. Of these, six species are newly described. The species appear to be described in the same careful way with numerous references and synonyms. Nine plates accompany this portion, illustrating the venation of the genera 13 figures, the male genitalia 36 figures, imagines 48 figures. This is a piece of work that really wanted doing as there exists no previous works on the Lepidoptera of the Argentine from a faunistic point of view. There were many records of species previously, and it was quite time that such a work be done. We can well say that the compilation of this matter is being done adequately and Capt. Hayward has done so much of this work that we feel sure it is quite correct and a capital basis for future work in the country, where there must be much to be discovered in the life-history of many species.

To Dr. Max Cretschmar we owe thanks for his pamphlet, 44 pp. and a map, dealing with the Lepidoptera of Rheinisch Westphalia with Essen for centre and including Wesel to Dusseldorf, and Krefeld to Dortmund. He has summarised the work previously done and published and included long summaries furnished by local observers: Herr Kilian-Stromberg for the Rhein, Mosel, Saar and neighbourhood; Herr C. Dahn-Krefeld for the Krefeld neighbourhood; Herr T. H. Voss-Hilden for the Dusseldorf neighbourhood; Herr Dr. H. Zielaskowski-Bochum for Essen; Herr O. Volker-Dortmund for the Dortmund region. The influence of the geological, botanical, and climatic conditions are introduced as factors in distribution and

occurrence. A map however sketchy is always a useful adjunct to a faunistic paper.

We are indebted to Dr. U. Rocci for a further Contribution on the "Variability of the male Armature of some of the groups of species of the genus *Melitaea*." This is the sixth of the series all but one of which have appeared in either the *Memories* or *Bollettino* of the Soc. Ent. Ital. There are many figures of the genitalia.

Count Turati has sent a separate of a recent communication of his to the *Boll. Soc. Ent. It.* descriptive of several new forms and species including a new form of *Parnassius apollo* and of *P. epaphus*, both of which are figured.

Part 2 of Vol. 8 of the *Transactions of the Entomological Society of the South of England* is to hand. Again another useful series of papers on "other orders" which cannot be overlooked by any workers in those orders. "Synonymic Notes on the *Syrphidae*" by E. R. Goffe will no doubt cause discussion; it is well that someone should look up and collate the work of these old authors which was often far from superficial. B. M. Hobby continues his observation on "prey" of insects, this time he treats of the "Prey of British Dragonflies;" he also commences a very useful piece of bibliography, "A list of Entomological Notes and Papers contained in the Serial Publications issued by local Scientific Societies in the British Isles," a work which will unearth a host of useful matter otherwise relegated by time to the oblivion of forgotten lore. F. J. Killington, "The Parasites of Neuroptera, with special reference to those attacking British species": another line of study only represented previously by isolated notes among the "forgotten lore." H. P. Jones, whose long paper on the "Hymenoptera of Hampshire" was published in our pages, gives a "Supplementary List." F. A. Turk contributes a "Preliminary List of British Collembola." The Lepidoptera is not omitted for W. Parkinson Curtis is publishing the notes left by the late Eustace R. Banks editing them where absolutely necessary. The present notes are on *Lithocolletis sorbi*, *L. concomitella* and *L. blancardella*. Mr. Curtis describes a new ab. of *Brenthis selene* under the name *obsolata* in his observations on the variation shown by an aberrant series in the collection of J. R. Freeman; at the same time he names an aberration of *Plebeius (Aricia) medon* as *striata*, in the same collection. The customary convention to indicate new species and forms by Clarendon letters is inoperative here as so much Clarendon is used throughout the publication in place of the usual italics and small and large capitals. Such practice delays the work of recorders infinitely. We congratulate the Society on its band of workers on untrodden lines. It is a pity that there seems no possibility of some of these papers being published in the *Transactions* of the premier Society for which they are eminently suitable.

Parts 54 and 55 of *Lepidop. Catalogus* have come to hand. They deal with the *Amathusiidae* by H. Stichel and the *Attacinae* sub-family of the *Saturniidae* by H. Schüssler. We are glad to see that the strange and confusing innovation in Part 53 the *Pieridae* has not been followed. So far as we have tested it, the work seems to have been thoroughly done and is a great help to all systematists and to

those who want readily to learn all about any species or genus in which they are interested. The wonderful genus *Taenaris*, with so many species in New Guinea, has 51 pages of references.

The next 2 parts of the *Supplement to Seitz Palaearctic Macrolepidoptera* are to hand. Part 39 continues the consideration of the *Agrotidae*, 8 pp. and 2 plates. The regretted decease of Dr. Corti is most unfortunate as his completed MS. ends with the commencement of this part. Prof. M. Draudt, however, has possession of Dr. Corti's notes and access to his collection and hopes to continue the consideration of this family on the lines previously laid down. The only British species occurring in the present part are *exclamationis*, *ripae*, *trux* and *puta*. Part 38 consists of 16 pp. and 1 plate of the so-called Bombyces. No less than 19 British species come in this part to each of which a few additional named forms are added. *Cerura furcula* has 5; *C. bifida*, 4; *Dicranura vinula*, 6; *Drymonia chaonia*, 4; *Notodonta dromedarius*, 4; *Ptilophora plumigera*, 8; *Phalera bucephala*, 6; and so on. The two plates of *Agrotids* seem to be very carefully executed and should prove of much use. We trust that all those who can in these difficult times are supporting this most enterprising and useful undertaking. The information that the helpers of Dr. Seitz have collected from many and often obscure sources is here arranged and rendered useful in comparison with previously recorded matter. The main volumes are progressing slowly, parts 547 and 548 are before us being parts of Vol. X, the Indo-australian Bombyces. There are 24 pp. and 3 plts. with 154 figures in the two parts the letterpress of which deals with the *Aegeriidae*. This volume is fast coming to the end. It is wonderful that this work, begun in 1906, has been able to continue until the present through so many world-wide vicissitudes and says much, not only for those concerned in its issue, editor and publisher, but for the continuance of subscribers' adherence, and bears strong evidence of the value of the information contained in its pages.

The last two issues of *Iris* (Dresden) contain several interesting and useful contributions. Dr. Zerny commences an article on the Lepidoptera of the Lebanon area reporting his own experiences and summarising the previous work which has been done there. The author registers a number of new forms and species from the district and the whole will form a most useful contribution to our knowledge of a little known country. Dr. Holik of Prague contributes an article on the crossing of *Zygaena* forms especially noting a crossing between *Z. filipendulae* and *Z. ephialtes*. The notes on the Lepidoptera of Regensburg, the area worked years ago by Zeller, are continued.

It is curious that the three Special Life Fellows recently elected at the Centenary of the Entomological Society of London should each be on the panel of editors of the three British entomological magazines: Commander Walker on the *E.M.M.*, W. G. Sheldon on the *Entomologist*, and Rev. G. Wheeler on the *Ent. Record and Jr. of Variation*. By the bye, we presume that the premier Society will now drop the local cognomen "of London" and henceforth be known as THE ROYAL ENTOMOLOGICAL SOCIETY, more especially as its purview has ceased to be local and has become preëminently national if not cosmopolitan in its application.

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Desiderata.—Species of Dolerine and Nematine sawflies not in my collection; list sent.—R. C. L. Perkins, 4, Thurlstone Road, Newton Abbot.

Duplicates.—Albimacula*, sparganii*.

Desiderata.—Ova of D.oo. pupae of X. gilvago, D. caesia. A. J. Wightman, "Aurago," Bromfields, Pulborough, Sussex.

EXCHANGES.—Living Eggs of Catocala fraxini and sponsea, exchange for butterflies of British Isles.—C. Zacher, Erfurt, Weimar, Street 13, Germany.

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Duplicates.—A large number of species of European and Palaearctic Rhopalocera and Heterocera.

Desiderata.—All British species especially those illustrating characteristics of an island fauna. Dr. Lor. Kolb, München 54, Dachauer-str. 409, Germany, and Franz Daniel, München, Bayer-str. 77, Germany.

Desiderata.—Living larvae or pupae of Lasiocampa quercus. Also set specimens of same species taken before 1910 in Devon or Cornwall.

Duplicates.—Payonia, set specimens or living stock: Monacha, ova: ochroleuca, griseola, advenaria, juniperata, thetis, etc.—J. A. Downes, 5, Trinity Road, Wimbledon.

URGENT.—Wanted English (Cumberland) Erebia epiphron. Adequate exchange will be made in European Lepidoptera.—B. C. S. Warren, 14, Avenue de l'Eglise Anglaise, Lausanne, Switzerland.

I am seeking an opportunity of exchanging Macro- and Micro-Lepidoptera with English collectors and beg to send list of duplicates.—J. Soffner, Trautenau (Bezirksbehörde), Bohemia, Tschechoslowakische Republik.

CHANGE OF ADDRESS.—T. Bainbrigge Fletcher, R.N., F.L.S., F.Z.S., F.R.E.S., to "Rodborough Fort," Stroud, Glos.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. October 4th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. June 22nd, July 13th.—Hon. Secretary, S. N. A. Jacobs, "Ditchling," Hayes Lane, Bromley, Kent.

The London Natural History Society.—Meetings first four Tuesdays in the month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through Members, or from the Hon. Sec. A. B. Hornblower, 91, Queen's Road, Buckhurst Hill, Essex.

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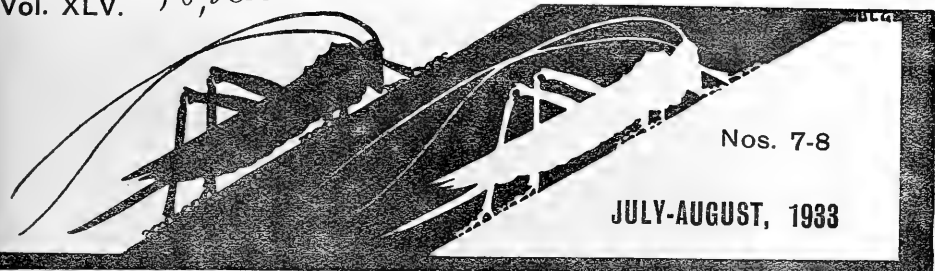
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The Larval Period of *Ageria apiformis* (*Trochilium apiforme*, Cl.).

By E. A. COCKAYNE, D.M., F.R.C.P., F.R.E.S.

Barrett says 'the larva is full-fed in April after feeding, probably nearly two years,' and Buckler with greater caution says 'the larval stage lasts for two if not three years.' In the first edition of Meyrick's handbook the larval period is given as '8-4, but sometimes living two years.' Thus there appears to be a good deal of uncertainty about the life-history of the larva.

At the end of June 1904 I took about twenty apparently full-grown larvae and three cocoons under the bark of some large hybrid poplars in Bagley Wood near Oxford. These larvae, found tunnelling between the bark and the wood, were kept alive until after my moths had emerged, and I concluded that the larva probably lives for a year in its last instar. In later years I had exactly the same experience in a Surrey locality, and returning to the place with Mr. C. N. Hawkins in February, 1932, we both found a few cocoons and a number of very large larvae boring channels between the bark and the wood. I kept about ten of them, placing them in a big flower-pot half full of earth. On the earth I put pieces of poplar bark, filled the pot with sphagnum, and covered it with a piece of linen. The pot was placed in a dish, which was filled with water from time to time. Examining it in September, 1932, and finding two larvae dead and mouldy, one still alive, and two cocoons, I left it undisturbed until April 17th, 1933. I had forgotten about it, but was reminded by finding large larvae in their tunnels and cocoons containing larvae in a wild state on the previous day.

In my pot there were six cocoons containing four dead larvae, one dead pupa, and one living pupa, from which a small male imago emerged on June 4th. This proves that the large larvae found in the spring of 1932 made their cocoons in the autumn, and pupated in the spring of 1933. The softer parts of the bark, which I had provided, had all been eaten, but the pieces were quite small, and the larvae had eaten very little during their last year of life. A comparison of the heads of the large larvae and those of skins cast at pupation shows no difference in size, apart from the difference between the two sexes, so that it is improbable that there was another ecdysis.

Both in 1932 and in 1933 I found one small larva, presumably a year younger than the big ones, and both the small larvae were further below the level of the ground than the big ones, all of which were boring in an upward direction. The scarcity of small larvae and the fact that both those found were so much below the level of the ground makes it probable that the larvae begin life deep down and gradually work upwards as they grow older. I am not sure whether the small larvae were one or two years old, but it should be possible by digging still deeper to find whether larvae of still smaller size can be taken at the same date. It is however clear that between February and April larvae in three distinct stages of growth can be found, small larvae, large larvae apparently in the last instar, and larvae in cocoons. The length of larval life cannot be less than three years or, to be exact, two years and eleven months. I am convinced that the larva of *Synanthedon scoliaeformis*, has the same habit of passing a year in its last instar, or if it does change skin there is no appreciable increase in size.

Noctuae in 1932.

By A. J. WIGHTMAN.

(Concluded from page 56.)

Xylyna semibrunnea.—During October and November a number of this species occurred at sugar and ivy bloom, especially the latter, and these were placed in a large glass box, 2 ft. long and twelve inches high and wide; the lower half of this has an outer layer of wood to render it less exposed to daylight and sunlight as it is kept in an open sided outhouse, and there is a wooden rim at the top where the glass lid fits on. Inside this outer box there is a branch of willow with the shoots cut off short 3 or 4 inches from the main stem and a small wooden box containing partitions of virgin cork so placed that moths entering it would be in darkness the whole twenty-four hours. Sweetened water is provided as food, the only place insects in this cage can get to be out of the light during the day is inside the inner box.

I had expected that the moths would have quickly disappeared into this inner box, to pass the winter, but up to the present (February) not one has done so. Instead they sit about on the upper wooden rim, no two close together, or collect in groups of 3 or 4 closely pressed together on the stunted willow shoots always with their heads just protruding beyond the end, and in this position they are wonderfully hidden, the shoot appearing slightly swollen just towards the end where the thoracic crests come and then rounding off where the heads are bent inwards to the centre. There are a few *X. socia* in this cage and they also behave in this way, but the species keep separate; there are no mixed groups.

There does not appear to be any true hibernation in the sense of a dormant period of months. Except in the coldest weather there is a good deal of movement at night and positions are frequently changed. When touched during the day with a camel hair brush legs are moved and in some cases the moth wakes up and walks several inches to a fresh spot.

Apamea didyma.—During July and August this species occurred as usual in enormous numbers in the Pulborough Marshes, the moths coming freely to sugar, as well as being found and easily examined at *Juncus* flowers.

The number examined must have run into very many thousands, and from these I selected and set up rather more than two hundred. The forms obtained are not so numerous as I had expected, but this may be in part due to the fact that I was very intent on only taking insects in bred condition and so may have given rather too little attention to the matter of forms. The forms taken are:—

<i>grisea-albo</i> , Tutt.	<i>rufa-albo</i> , Tutt.	<i>nigra-flavo</i> , Tutt.
<i>grisea-flavo</i> , Tutt.	<i>nictitans</i> , Esp., Hb.	<i>nigra-albo</i> , Tutt.
<i>reticulata-albo</i> , Tutt.	<i>secalina</i> , Hb.	<i>lugens</i> , Haw.
<i>secalina</i> (γ), Haw.	<i>nictitans lineata</i> , Tutt.	<i>lugens-flavo</i> , Tutt.
<i>I-niger-albo</i> , Tutt.	<i>secalina-lineata</i> , Tutt.	<i>albistigma</i> , Tutt.
<i>I-niger</i> , Haw.	<i>didyma</i> , Esp.	<i>leucostigma</i> , Esp.
<i>oculea-flavo</i> .	<i>didyma-flavo</i> , Tutt.	

All the above names are taken from the table in *Supp'. Notes to Brit. Noct. and Vars.* by H. J. Turner, page (224). There is also a

single example which agrees well with Warr.-Seitz description of his ab. *lilacina*, *Pal. Noct.* III. 171 (1911), fig'd. at 40h, except that it has a yellowish reniform = *lilacina-flavo*.

Heliothis peltigera and parasites.—In my 1931 notes on *Heliothis peltigera*, I mentioned that, although I was confident I was right in saying that the flies *Orthostigma pumila*, Nees., and *Aspilota insidiatrix*, Marsham, which had occurred in the breeding cage were from the larvae of *peltigera* and not, as had been suggested, from some Dipterous larvae which might have been present in the leaves of the foodplant (*Senecio*), I was not prepared to be dogmatic. This year I did not breed any more *peltigera*, but kept a quantity of the foodplant, which came from the same locality as the larvae and their food supply in 1931 and this was taken at the same time of the year, but it failed to produce any flies at all, and I am now quite certain that the flies were from the *peltigera* larvae, quite possibly of course as super parasites.

Abrostola tripartita, Hufn.—In the *Victoria History of Sussex* the statement is made that, while this species is plentiful in East Sussex, its congener *triplasia* is the more plentiful species in West Sussex and the locality of Bury is given as specially favoured by that species.

Having been resident and active in the search for Noctuae in this district, which includes Bury, for upwards of ten years without ever to have taken a single example of *triplasia* among the large number of *tripartita* taken and bred from wild larvae, I feel sure there must be an error in the statement referred to, possibly a confusion of names, *tripartita*, Hufn., being the same species as *triplasia*, Hübner (fig. 269), I can hardly think there has been a change in the local fauna as great as would be required to reconcile that statement with the result of my collecting.

This year having decided to confine my collecting largely to Pulborough district, I made a special effort to find this species *triplasia*, Linn., and for a period of 6 weeks beat both nettle and hop several evenings a week in different spots, Pulborough, Littleworth, Bury, Amberley, Burham and Arundel.

Abrostola larvae were plentiful in all stages of growth throughout the whole district, all, when beaten, being pale green in colour, but after a while I noticed in the breeding cages a good number of very different looking larvae to those which I had been beating and it was obvious that some of the small green larvae had changed to other colours upon approaching full growth. These larvae varied from deep olive green (rare) to deep purplish brown, and I at first imagined that I had at last taken larvae of *triplasia* from nettle. The hop having failed to produce any larvae at all, as however I continued to take only green larvae wild and could never beat a purple brown one, I felt perplexed, and submitted a few larvae of each shade to Dr. E. A. Cockayne who at once informed me that all were *tripartita*, the green form being the usual one wild and the purple brown the more usual one in captivity; in fact, wild larvae of this last colour are distinctly rare.

I continued to beat for these larvae in the hope of at last finding the desired species (*triplasia*) and finally I did beat three purple brown larvae of *tripartita* all close together. The percentages proved to be.

Wild larvae when beaten:—Green 99%, purple brown 1%.

Larvae in cages when full fed and ready to spin up:—Green 37%, purple brown 63%.

The larvae of this species do not invariably turn brown when ready to pupate. I examined many cocoons and found green larvae as long as ten days after spinning up, and wild full-fed green larvae never change to purple brown.

Late in November the larvae of this species were still to be found, often quite small; none made any attempt to suspend feeding and winter as a larva. But the larvae of *Plusia chrysitis* taken with them absolutely refused to be coaxed by being kept warm, into feeding after the usual hibernation size was reached.

I noted that in the late summer larvae pupated a few days after spinning up and pupation gradually lengthened, and some I had after the weather had become cold had not pupated until fourteen days after spinning up. Eighty or ninety per cent made earthen cocoons, the rest spinning up in a dead leaf, except one, which made an independent cocoon such as *Plusia moneta* does.

Donegal in August.

By REV. CANON FOSTER, B.D.

(Concluded from page 83.)

Hipocrita jacobaeae, L.—Larvae abundant at Portnoo.

Demas coryli, L.—On hazel. Portnoo and Gartan.

Agrotis cursoria, Hufn.—I secured 12 specimens on ragweed, which grew on or about the sandhills at Narin and Portnoo. Some of the forms were very fine and of great beauty. But the border line between *cursoria* and *tritici* is very close at Portnoo, and some specimens were not easy to discriminate.

A. tritici, L.—Very abundant at Portnoo and even more varied than elsewhere.

A. praecox, L.—At Portnoo in 1930 this species was very abundant and I only regret I did not secure more of them.

A. lucerneae, L.—One specimen turned up at light at Portnoo. But it never showed at the ragweeds.

A. saucia, Hb.—Two very worn specimens were taken; no doubt it was too early for the autumn brood, and these had survived from the early summer.

Noctua dahlia, Hb.—On ragweed at Gartan.

N. rubi, View.—Donegal; very richly coloured.

N. glauca, Esp.—Heather bloom and ragweed, Portnoo and Gartan.

N. baja, F.; *N. c-nigrum*; *N. xanthographa*, Fabr.; *N. brunnea*, Fabr., at ragweed; *Triphaena comes*, Hübn.; *T. pronuba*, Linn.; *T. janthina*, Esp., all abundant.

Charaxes graminis, L.—Was often to be seen day and night on ragweed, especially at Gartan, 1932.

Cerigo matura, Hufn.—On ragweed. Portnoo.

Miana literosa, Haw.—Abundant.

Polia chi, L.—Three specimens turned up at Portnoo, on ragweed.

Helotropha leucostigma, Hb., and var. *fibrosa*, Hb.—Were both very abundant on ragweed at Portnoo. They were so fine that it was hard to resist taking them.

Hydroecia crinanensis, Brws.—These were even finer and my son

when out with me was so delighted with their size and colouring that he often compelled me to take them. They were in numbers on the ragweed both on the shore and also up among heather at Portnoo. At Gartan they came to light and were also on ragweed and other flowers, all at night. Here they were not so abundant as at Portnoo.

H. lucens, Fr.—3 specimens at Portnoo on heather and on ragweed among the sands.

Stilbia anomala, Hw.—Some lovely specimens turned up at Portnoo at night on ragweed or heather blossom, and by day just sitting on the ground.

Xanthia flavago, F.—Was abundant on ragweed at Portnoo and also at Gartan.

Plusia bractea, F.—One specimen was caught at thistle blossom at Portnoo in August along with the more abundant *P. chrysis* and *P. pulchra*. It was a very worn specimen and no doubt merely a survival from July.

Other abundant Noctuae were *H. micacea*, Esp., *Leucania impura*, Hb., *Tapinostola fulva*, Hb., *Caradrina quadripunctata*, F., *Amphipyra tragopogonis*, L., *Rivula sericealis*, Sc., *Hypena proboscoidalis*, L., etc.

GEOMETRAE.

Epione repandaria, Schiff. (*apiciaria*, Schiff.)—Appeared at Gartan both on ragweed at night, and by beating willow by day.

Ennomos alniaria, L.—Came to light at Gartan.

Hybernia aurantiaria, Esp.—The larva was beaten out of birch at Gartan, and a male emerged the beginning of November.

Acidalia aversata, L.—A fine banded specimen turned up at Portnoo.

Anaitis plagiata, L.—Was abundant on rocks and among heather at Portnoo.

Ortholita chenopodiata, L. (*limitata*, Sc.)—*Lygris populata*, L., *Cidaria fulvata*, Forst. and *Dysstroma citrata*, L. (*immanata*, Hw.) were all abundant.

Calostigia (Malenydris) salicata, Hb.—Was resting on the rocks at Portnoo in August, and came to light the same month at Gartan.

C. (M.) didymata, L.—Was common everywhere.

Xanthorhoe fluctuata, L.—Abundant.

X. galiata, Hb.—abundant near Portnoo among the sandhills.

Eulype hastata, L.—The black larvae were often to be seen at Portnoo, Gartan, etc., in the tips of bog myrtle.

Thera cognata, Thnbg.—On juniper around Portnoo the caterpillar was pretty frequent in August, and the perfect insects emerged the first week of September. They were also to be found flying over juniper, or settled upon it, at night, during August. Along with them fairly abundantly was to be beaten out in the day time *Eupithecia sobriata*, Hb.

Hydriomena furcata, Thnbg. (*sordidata*, F.)—Was in great variety among the willows at Gartan.

One specimen of *Triphosa dubitata*, L., came to light at Donegal town, as also *Crocallis elingvaria*, L.

Perhaps the most interesting Geometer to turn up was one specimen of *Gnophos myrtillata*, Thn.; it was flying gently along a heathery

bank one night at Portnoo. This would be the third Irish specimen. Of the other two, one was also from Donegal, and the other taken during the Clare Island survey.

Selidosema plumaria, Schiff. (*ericetaria*, Vill.).—The males were flying strongly one mid August day over the heather near Dungloe.

Crambus geniculeus, Hw.—Was abundant at Portnoo.

C. margaritellus, Hb.—Was in great abundance in various places around Gartan Lake.

Among the Plumes there occurred at Gartan *Stenoptilia pterodactylus*, Linn., (*fuscus*), *Amblyptilia cosmodactyla*, Hb. (*acanthodactylus*, Brit. authors) and *Platyptilia gonodactyla*, Schiff.

There were some interesting Tortrices among the heather at Portnoo; at Donegal the best ground was the wooded path south of the town along the west bank of the Eske; this was also a good locality for Hymenoptera. At Gartan the Tortices were very plentiful and *Paedisca solandriana* was in great variety and abundance. Scrub birch was the most prolific tree to work, although not so plentiful as willow or hazel.

Tortrix rosana, L.—The pupa was fairly common in the spun-up shoots of various shrubs, e.g., willows, at Portnoo and Gartan.

T. heparana, Schiff.—Portnoo and Gartan.

Amphisa gerningana, Schiff.—Among heather at Portnoo, and Barnesmore Pass.

Peronea variegana, Schiff.—Donegal Town.

P. ferrugana, Schiff.—Beaten out of birch abundantly near Churchill station.

P. hastiana, L.—Donegal town.

P. schalleriana L.—Donegal town, very abundant at Gartan in the following varieties; *perplexana*, *labeculana*, *comparana*, and *latifasciana*.

P. aspersana, Hb.—Portnoo, Gartan, Donegal town.

Teras caudana, F.—Donegal town; very abundant, Gartan.

Cnephasia subjectana, Guen.—Gartan.

C. virgaureana, Tr.—Gartan.

Eucosma solandriana, L.—The following varieties were all abundant at Gartan; *solandriana*, *parmatana*, *trapezina* i, ii, iii, *scotch* a and b.

E. semifusca, Stph.—Gartan.

E. similana, Hb.—very abundant among birch at Gartan.

Phtheochroa maculosana, Haw.—Donegal town, Portnoo.

Eucosma cana, Haw.—Donegal town.

E. ramella, L.—Gartan.

E. nisella, Clerck.—Gartan.

E. trimaculana, Don.—Gartan.

E. penkleri, Fisch.—Donegal town, Gartan.

Acroclita naevana, Hb.—Gartan.

Eucosma cruciana, L.—Portnoo, Gartan.

E. corticana, Hübn.—Portnoo.

E. trigeminana, Stph.—Gartan.

Cnephasia osseana, Scop.—Portnoo, Gartan.

Notocelia incarnatana, Hübn.—Gartan.

Among the Tineina were noted:—

Simaethis pariana, Clerk.—Donegal town.

Plutella costella, F.—Gartan very abundant.

Gracilaria elongella, L.—Gartan.

Argyresthia senescens, St.—Gartan.

Cerostoma xylostella, L.—Gartan, Donegal town, very abundant.

Chelaria hübnereella, Don.—Gartan.

I wish to thank the Rev. R. E. E. Frampton for overhauling all the 'Micros.'

LEPIDOPTERA AT MAURIN, BASSES-ALPES, FRANCE, From mid June to September 8th, 1932.

Based on the Observations of A. E. BURRAS, F.R.E.S., W. PARKINSON
CURTIS, F.R.E.S., and W. FASSNIDGE, M.A., F.R.E.S.

(Continued from page 74.)

PSYCHIDAE.

Oreopsyche muscella, Fb., common in July, A.E.B.; the scaling seems to be very heavy for this species, and this seems to be the only difference between it and *G. sicheliella*, Bruand, if this latter is really distinct. *O. plumifera*, Ochs. form *mediterranea*, Led., common in July, A.E.B. *Cochliotheca crenulella*, Bruand, fairly common at light. *Banksia alpestris*, Hein, six ♂♂, cases common.

COSSIDAE.

Cossus cossus, L., a few. *Dyspessa ulula*, Bork., rare.

LASIOCAMPIDAE.

Malacosoma castrensis, L., a few by W.F. *Lasiocampa quercus*, L., small larvae. *Macrothylacia rubi*, L., larvae fairly common. *Epicnaptera tremulifolia*, Hb., larvae rare on aspen.

ZYGAENIDAE.

Procris globulariae, Hb., a few. *P. geryon*, Hb. form *chrysocephala*, Nickerl, common at 8,000 feet. *Zygaena exulans*, Hoch., fairly common. *Z. achilleae*, Esp., fairly common. *Z. carniolica*, Scop., rare. *Z. trifolii*, Esp., not common; chiefly race *palustris*, Obthr.; W.P.C. took ab. *orobi*, Hb., and a black ab. described in the addenda. *Z. transalpina*, Esp., fairly rare. The scarcity of Zygaenids was very noticeable although larvae were reported very abundant in early July by A.E.B. No doubt the severe frosts and heavy rains were responsible for this scarcity.

PYRALES.

Ephestia elutella, Hb., very common in the Café Bertrand. *Homocerosoma nebulella*, Hb., fairly common. *Nyctegretis achatinella*, H.-S., abundant. *Ancylosis cinnamomella*, Dup., common. *Pempelia ornatella*, Schiff., common. *Euzophora cinerosella*, Zell., a few. *Hypochalcia decorella*, Hb., common. *H. lignella*, Hb., rare. *Catastia marginea*, Schiff., rare. *Epischnia ampliata*, Hein., common. *E. boisduvaliella*, Gn., fairly common. *Psorosa palumbella*, Schiff., a few. *Nephteryx hostilis*, Steph., larvae very common on aspen. *Megasis rippertella*, Zell., a few by A.E.B. *Selagia spadicea*, Hb., rare.

Myelois cribrella, Hb., a few. *Crambus lithargyrellus*, Hb., common. *C. zermattensis*, Frey., two specimens, Panestrel. *C. furcatellus*, Zett., fairly common, a very distinct form. *C. conchellus*, Schiff., fairly common. *C. specularis*, Hb., common. *C. luctiferellus*, Hb., rare. *C. falsellus*, Schiff., fairly common. *C. culmellus*, L., common. *C. dumetellus*, Hb., locally common. *C. pratellus*, L., common. *Argyria cerussellus*, Schiff., common, a very dark form. *Aglossa pinguinalis*, L., indoors. *Botys angustalis*, Schiff., rare. *Scoparia zelleri*, Wocke., det. Lhomme. *S. ambigua*, Tr., common. *S. valesialis*, Dup., det. W.P.C. *S. sudetica*, Zell., det. W.P.C. and Lhomme. *S. resinea*, Haw., det. Lhomme. *Oreana rupestralis*, Gey., rare. *O. alpestralis*, Fb., fairly common. *Orobena sophialis*, Fb., common. *Nomophila noctuella*, Schiff. *Cynaeda dentalis*, Schiff., fairly common and very large. *Titanio pyrenealis*, Dup., rare. *T. phrygialis*, Hb., common, especially near water. *Mesographa crocealis*, Hb. *M. costalis*, Ev., seven each by W.F. and W.P.C. See addenda for synonymy and distribution of this interesting species [Note I.]. *M. lutealis*, Hb., common. *Pyrausta fuscalis*, Schiff. *P. terrealis*, Tr., rare. *P. flavalis*, Schiff. var. *lutealis*, Dup. common. *P. aeralis*, Hb. var. *opacalis*, Dup., common. *P. austriacalis*, H.-S., very common. *P. uliginosalis*, Hb., common. *P. alpinalis*, Schiff., common. *P. rhododendronalis*, Dup., rare. *P. cespitalis*, Schiff. *P. costalis*, Tr., rare. *P. purpuralis*, L., common. *P. aurata*, Scop. *P. nigrata*, Scop., rare. *P. cingulata*, L., fairly common; see addenda for the form. *Heliothela atralis*, Hb., fairly common on steep and sunny paths; very difficult to catch. [Note II.]. *Aphomia sociella*, L., common.

PTEROPHIDAE = ALUCITIDES.

Eucnemidophorus rhododactylus, Fb., rare. *Platyptilia gonodactyla*, Schiff., fairly common. *Amblyptilia acanthodactyla*, Hb., = *cosmodactyla*, Hb., common. *Stenoptilia bipunctidactyla*, Haw. *Marasmarcha phaeodactyla*, Hb. = *lunaedactyla*(us), Haw., common. *Oxyptilus distans*, Zell. *O. pilosellae*, Zell., fairly common. **O. teucii*, Jordan = *heterodactyla*, Müll., a few. *Pterophorus lithodactyla*(us), Tr., three specimens. *P. monodactyla*(us), L. *P. (Leioptilus) osteodactylus*, Zell. *L. tephradactylus*, Hb. *Alucita xanthodactyla*, Tr., fairly common.

TORTRICINA.

Acalla hastiana, L., a few bred. *A. variegana*, Schiff. *Dichelia gnomana*, Cl., common. *Cacoecia rosana*, L. *Eulia rigana*, Sodof., var., *monticolana*, Frey, rare. *Tortrix bergmanniana*, L., common in September. *T. viburniana*, Fb. *Cnephasia osseana*, Scop., common. *C. alticolana*, H.-S., (det. H. Stringer.) *C. chrysanthæana*, Dup. *C. penziana*, Thunb., common. *C. canescana*, Gn., (det. H.

* "*Oxyptilus teucii*, Jordan. = *heterodactyla*(us), Müller." Presumably the species intended is *Oxyptilus heterodactyla*(us), Müller 1704. As regards the "*teucii*, Jord." part of it, I cannot trace any description by Jordan. In *E.M.M.* VI., 14-15 (1869) Jordan referred to *Pterophorus teucii* and in *E.M.M.* VI., 122 (1869) to *Oxyptilus teucii* and in 1870 Stainton (*Ent. Ann.* p. 143) also referred to *Oxyptilus teucii*, but in no case is any description given, so that the name *teucii* does not seem to be valid from those dates, or describable to Jordan. (It was apparently a M.S. name of Greening's. See Tutt *Brit. Lep.* Vol V. p. 471.)—T.B.-F.

Stringer.) *C. sinuana*, Steph., rare. *Phalonia aleella*, Schulze, common and very large. *P. ciliella*, Hb. *P. pallidana*, Zell. *P. dubitana*, Hb. *P. hybridella*, Hb. *Euxanthus hamana*, L. *E. angustana*, Tr. *Argyroploce charpentierana*, Hb., rare. *A. lacunana*, Dup., common. *A. rivulana*, Scop., common. *A. branderiana*, L., common; larval habitations very common on aspen, often utilized later by larvae of *N. hostilis*, Stph. *A. mygindana*, Schiff., locally very common. *A. rufana*, Scop., very common, and var. *arcuana*, Lah. *Olethreutes scoriana*, Gn., rare, Panestrel and Fort Sancté. *Ancylys lundana*, Fb. *A. comptana*, Fröl. *A. unguicella*, L. *Enarmonia diniana*, Gn., fairly common. *E. cruciana*, L., fairly common. *Pamplusia mercuriana*, Hb., very common. *Gypsonoma aceriana*, Dup. *Cydia neglectana*, Dup. *C. ramella*, L., rare. *C. fractifasciana*, Haw. *Semasia pupillana*, Cl., fairly common. *Thiodia citrana*, Hb., fairly common. *Tmetocera ocellana*, Fb., var., *lariciana*, Hein, rare. *Notocelia roborana*, Tr., common. *N. incarnatana*, Hb. fairly common. *Epiblema cana*, Haw. *E. pflugiana*, Haw. *E. tripunctana*, Fb. *E. subocellana*, Don. *E. cinerana*, Haw., fairly common on aspen trunks. *E. solandricana*, L., rare. *Hemimene plumbagana*, Tr., common. *H. simpliciana*, Haw., rare. *Lipoptycha plumbana*, Scop., common. *Laspeyresia succedana*, Fröl., and var. *ulicetana*, Haw.

TINEINA.

Choreutis myllerana, Fb. *Glyphypteryx equitella*, Scop., a few. *Aegeria apiformis*, Cl., one specimen by W.F.; larval borings very common in stunted aspens. *Dipsospechia ichneumoniformis*, Fb., fairly common; larvae apparently fulfilled common in roots of *Anthyllis*. *Psecadia pusiella*, Röm., fairly common. *P. bipunctella*, Fb., a few. *Depressaria liturella*, Hb. *D. pimpinellae*, Zell. *D. angelicella*, Hb. *Pleurota aristella*, L., common. *Anchinia daphnella*, Hb., fairly common. *A. grisea*, Frey, one specimen by W.F. *Symmoca signatella*, H.-S., rare. *Acompsia tripunctella*, Schiff., common. *Sophronia semicostella*, Hb., fairly common. *S. humerella*, Schiff., very common; W.F. saw a swarm of ♂♂ assembling to a ♀. *Nothris verbascella*, Hb., a few bred. *N. lemniscella*, Zell., a few. *Tachyptilia populella*, Cl. *Gelechia hippophaëlla*, Schrk., common. *G. holosericella*, H.-S. *G. distinctella*, Zell., common. *G. nigricans*, Hein. (separated from *G. oppletella*, H.-S., by Chrétien). *G. rumicivorella*, Mill. *G. perpetuella*, H.-S. *G. interalbicella*, H.-S. *G. solutella*, Zell. *G. elatella*, H.-S. (*bagriotella*, Dup.) *G. albifemorella*, Hofm. *G. tessella*, Hb. *G. longicornis*, Curt. *Lita ricinella*, Dgl. *L. samadensis*, Pfaff. *Bryotropha senectella*, Zell. *Metzneria neuropterella*, Zell. *Anacampsis patruella*, Mann. *A. coronillella*, Tr. *A. anthyllidella*, Hb. *A. vorticella*, Scop. *Argyritis pictella*, Zell. *Pancalia leuvenhoekella*, L. *Coleophora spissicornis*, Haw. *C. ornatipennella*, Hb. *C. bilineella*, H.-S. *C. onosmella*, Brahm. *C. laripennella*, Zett. *C. auricella*, Fb. *Epermenia securella*, H.-S., common among bearberry. *Scythris fallacella*, Schläg., common. *S. chenopodiella*, Hb. *Hyponomeuta padellus*, L. *H. padi*, Zell., (*evonymella*, L.) (det H. Stringer.) *Plutella geniatella*, Zell. *P. maculipennis*, Curt. *Tinea hedemanni*, Rbl. *Nemotois metallicus*, Poda (*scabiosellus*, Scop.), common on Scabious heads. *N. minimellus*, Zell. *Opostega salaciella*, Tr.

MICROPTERYGINA.

Heptalus sylvinus, L. *Micropteryx aureatella*, Scop.

To Monsieur Léon Lhomme and to Mr. H. Stringer of the British Museum our best thanks are here offered for their kindly help with numerous difficult determinations.

[NOTE 1.—*Mesographe costalis*, Ev., is the determination of certain French entomologists. W.P.C. determined it as *Hapalia itysalis*, Wlk., with which Mr. Meyrick agreed. Mr. N. Filipjev has been good enough to send W.P.C. a topotype and metatype of *costalis*, Ev. These differ markedly from the Maurin insect in genitalia. The matter is still under investigation, but it is almost certain that the insect will prove to be *itysalis*, Wlk., a N. American species.]

[NOTE 2.—*H. atralis*, Hb. is the determination of the same French entomologists. W.P.C., after careful inspection of Frey's type of *praegalliensis*, determined the specimens as *praegalliensis*. The B.M. has a specimen from Larche standing under *praegalliensis* identical with the Maurin species. If sufficient material, at present not available, can be obtained this will be closely investigated as great confusion at present seems to exist in this genus.]

(To be concluded.)

Zygaenae, Grypocera and Rhopalocera of the Cottian Alps compared with other races.

By ROGER VERITY, M.D.

(Continued from page 93.)

Argynnis daphne, Schiff., presumably race *tenuitermaculosa*, Vrtý :—Higgins states he has found this species at Oulx. As I have not met with it, I cannot make sure of the race from actual specimens, but on the other hand, there can be little doubt it is that mentioned above, because that is the one of the Baths of Valdieri, in the Maritime Alps, and at Oulx most species resemble those of Peninsular Italy considerably more than they do there. When Turati and I applied the name of *nikator* to the Valdieri race, the very distinct further grade of variation *tenuitermaculosa* had not been detected and distinguished by me from specimens of Florence. We must now be more exact and note that it decidedly belongs to the latter grade, with only just a few individuals approaching *nikator*, such as one does not find in Tuscany. It must furthermore be added that there exist two more grades in Switzerland and in the Upper Adige (S. Tyrol), which are well worthy of distinction : Frühstorfer included them both in his description of *nikator*, but he added the remark that "females from the Valais were, anyhow, still more conspicuous than the finest ones he had from Klausen." Comparing two large series of specimens I have collected in these localities, I find those from the Upper Adige are, on the whole, exactly intermediate between the nominotypical race of Vienna and those from Lavey and Martigny. The average size is smaller in both sexes and the largest Swiss form is never equalled by any individual ; the fulvous is usually a little richer and warmer in tone and the underside vinous colour is deeper and less broken by clearer spaces ; the black markings are markedly more pronounced and those of the underside of the

forewing are not as reduced. I consequently suggest restricting Frühstorfer's name to the Valais and Vaud race and naming the Upper Adige one **praenikator**, n. nov., from my series of cotypes of Chiusa (Klausen).

The race of the coast range of Calabria, which I have pointed out, in the *Ent. Rec.*, 1924, p. 41, as quite similar to *nikator*, should retain this name, because the underside colours and markings correspond exactly to the Swiss specimens and are lighter than in *praenikator*; the upperside ones are, perhaps, more like the latter. A few individuals point to the race of the extreme south of Calabria, which Stauder has described from S. Fili and Aspromonte and named *japygia* (*Iris*, 1921, p. 30 and *Societas Entomologica*, 39 (1924), p. 19): male of normal size, but of a fiery red colour; female large and of a pale, reddish tone; markings larger than in any other race, but distinctly separate, as in *ochroleuca* figured by Seitz, also in the outer part of the wing; their black colour has a sheen. It thus corresponds to *A. niobe* race *rubida*, Vrtý.

My examples of *daphne* from Ax-les-Thermes, in the Pyrenees of the Ariège, belong to race *tenuitermaculosa*, so that, probably, all the French *daphne* should bear this name, as all the localities from which it is known are even warmer and drier than Ax.

In Italy the habitat of *tenuitermaculosa* extends from the hills of the province of Modena, on the northern watershed of the Apennines, and from the pine-woods on the coast of Tuscany, north of Viareggio, down to the Mainarde Mountains (Mollarino Valley, 500m.), north of Naples.

In Sicily there exists a most remarkable dwarf race. It has, probably, not yet been described on account of the fact it scarcely exists in collections, owing to the restricted localities it inhabits in the Caronie and in the Madonie mountains (Madonna dell' Alto and M. San Salvatore), but its appearance had struck Calberla over fifty years ago and he remarks it is extremely small and its underside strongly recalls that of *ino*, to which Ragusa had referred it at that time. Having been fortunate enough to secure a set, collected for me by Mariani, in July, 1929, in the two aforesaid localities of the Madonie, I now name it **siciliaenana**, n. nov. The length of the forewing, in the male, is of about 20mm. against the 23 or 24 of *tenuitermaculosa* and *nikator*; in the female it is 23 to 24 against 25 to 27; the impression is of a smaller insect than these figures convey. The fulvous is about the same as in *nikator*, i.e., a little richer and warmer than in *tenuitermaculosa* and so is the size of the black spotting; the underside of the hindwing is, on the contrary, considerably lighter than in the latter and is rendered quite peculiar and more like *ino*, by the presence of broad pinkish areas, on which restricted vinous patches, eye-spots, a series of premarginal lunules and a thin streak along the margin stand out separately; most of the vinous colour is also replaced by chestnut, clearer in the male and partly overshadowed with greyish in the female.

Argynnis (*Issoria*) *lathonia*, L., race *emiflorens*, Vrtý., trans. ad *florens*, Vrtý., at Oulx (from July 6th onward). Species seen also at Cesana and Clavières.—The Oulx race is the only one I am acquainted with, outside Peninsular Italy, which approaches the handsome one from this region, I have described under the name of *florens*. No

specimens actually reach the size of the largest ones of the latter, but many are larger than the, smaller, *emiflorens* ones and all exhibit the rich, warm and vivid tone of fulvous, which is quite a peculiarity of those two forms from Peninsular Italy.

Argynnis aglaja, L., race *emilocuples*, Vrtý: Oulx (males from July 6th, females from 9th and some still fresh at the beginning of August); Cesana (males on July 15th and females emerging on August 1st); Clavieres (a few of both sexes on July 29th).—Whilst most butterflies, as we have seen, exhibit the facies of different races in these three very different localities, *aglaja* does not change aspect. In all three it has the smallest average size of *emilocuples* and the female is especially noteworthy by never developing into the larger sized ones which are met with in most localities of this race. I have discussed the *aglaja* of this region in a paper on this species to be published shortly.

Argynnis niobe, L., race *pinguis*, Vrtý: Oulx (males from end of June, females from July 12th till the end of the month); race *alpium-stricta*, Vrtý: Sestrières (both sexes abundant and in fresh and worn conditions on August 8th).—The Oulx race is exactly similar to that of the Baths of Valdieri, in the Maritime Alps, which varies, in fact, very little, as far as I know, in the whole of the Western Alps, except in that it is replaced in the highest and coldest localities by race *alpium-stricta*, I have described precisely from the peat-bogs of the Col de Sestrières, 2050m., in the *Bull. Soc. Ent. de France*, 1929, p. 243. The latter is very similar to the very small, pale, dull and heavily marked nominotypical race of Sweden and the former is certainly much brighter, larger and flourishing, in aspect, as compared with them, but the name of *pinguis* does not, on the contrary, suit it at all, if one compares it with most other Alpine races. Like *aglaja*, it keeps, at Oulx, to the smallest size one meets with at low altitudes in the Alps; in my typical series, from Valdieri, there are some slightly larger individuals, but they give anything but an impression of pinguitude, there or anywhere else in the Western Alps, if one puts them side by side with the giant and magnificent *alpiumlaranda*, Vrtý., of the mountains around Lake Maggiore, and with the largest *niobe* one knows of from the Alps, of the Anzasca Valley, at the foot of Mt. Rosa, I have named *alpiumlata* in the aforesaid paper.

At Oulx I found a fine female example of ab. *fasciata*, Black.

Argynnis adippe, Rott. (nec L.), race *adippe*, Rott. = *phryxa*, Bergstr.: Oulx (males from July 14th; this species was not uncommon at the end of the month and fresh females were still found on August 11th).—I have discussed the specific name of this species on several occasions and I have given my last view, in connection with this difficult question, in the *Entom. Record* of 1930, p. 150. If one accepts the conclusion that Rottemburg is its author, and not Linnaeus, the nominotypical form and race of *adippe* is that of Germany, which has a very uniformly clear yellow ground-colour on the underside of the hindwings, with very slight traces of green or of russet patches, just as Bergstrasser has figured it, under the name of *phryxa*. Such is, precisely, and, to my knowledge, quite constantly, the race of Oulx, which only differs from the average German examples of this sort by its smaller size and

by its slightly warmer tone of fulvous, evidently due to the warmer and drier surroundings. These, however, have evidently not produced, as in many other species, any tendency to the clear, yellowish fulvous of *clarens*, Vrtý., from Central Italy, nor to the disappearance of the silver spots and to the effacement of the pattern on the underside, which the latter exhibits.

Argynnis (*Dryas* not valid as a name for this section of the *Argynnidi*, because Hübner only uses it in the "*Tentamen*" leaf, which has been rejected by the Zoological Nomenclature Commission, so that I think the name of *Argyronome*, Hüb., is the one to use) *paphia*, L., race *paphia*, L.: Oulx (a few, at the middle of August, but very scarce).—Of small size, like the other *Argynnidi* at Oulx, and thus, in this case, similar to the northern, nominotypical, form.

Pyrameis cardui, L., race *universa*, Vrtý.: Oulx.—As a contribution to the puzzling question of the number of emergences and generations of this species, I can state that worn and fresh individuals existed at the end of June and at the beginning of July, that it then entirely disappeared and that a number of perfectly fresh ones, which had, no doubt, just emerged, made their appearance on August 3rd, at the same time as the *G. c-album* in the same condition, so that they must have been the offspring of the first lot observed and thus, the second generation at Oulx. Both lots had the usual average facies of *cardui* in most localities.

Pyrameis atalanta, L., race *atalanta*, L.: Oulx.—In this case hibernation at the imago stage is a well known fact and the bad conditions of all the individuals I found at the same time as the first lot of *cardui* plainly showed they had undergone it. The first freshly emerged specimen was found on August 10th and others on the 16th and 17th. This seems to indicate that there is only one generation.

(To be continued.)

CURRENT NOTES AND SHORT NOTICES.

Dr. Malcolm Burr sends us the following cutting. It seems incredible. Is it really true?

"A STRANGE INDUSTRY.—Even many fishermen have been puzzled by the wording of a Treasury Order adding untrimmed natural silk-worm gut to the Imports Free List.

It is stated that this article is "the raw material for making gut for fishing tackle and for surgical suture." This would suggest that actually the interior of the silkworm is used, and not, as is generally supposed, some product of the insect, whose interior economy would seem to be about the last thing to provide the required consistency and strength.

But it is so. The gut comes from Murcia, in South-eastern Spain, where millions of silkworms are killed at a time. The intestine, which would otherwise form the silk-spinning apparatus, is extracted, dried and packed in bundles."—*Sunday Express*, 25.vi.33.

[Yes: quite true. This is the usual method of making "gut" for

surgical and fishing purposes. It is also made in Japan, India, France and Italy.—T.B.-F.]

The *Zeit. Osterr. Ent. Verein.* (Wien). 1-6 (1933) contains a large amount of interesting matter, and is illustrated rather more than is usual in our smaller magazines. There are no less than 11 plates so far. The first illustrates Dr. Galvigni's article on a new subsp. of *Pyrausta alpinalis* from the Oststeier, which he names *valerialis*. We took a very pale form of this species at Andermatt a few years ago. The second plate illustrates an article by Kautz on some notable forms of *Pieris bryoniae* and *P. napi*, with reference to the question whether there be one or two species. Herr Foltin gives a useful account of the Lepidoptera found on the highland moors around Mondsee in Upper Austria. The third plate gives 7 figs. of the forms of the 'clearwing' of the Euphorbia, *Chamaesphecia stelidiformis*. This feeds on *Euphorbia epithymoides*, but the new form *amydaloidis* feeds in *E. amydaloides*. Plate four is devoted to the forms of a species of *Euchloris*, *E. plusiaria*. Plate five illustrates a new aberration of *Schoenobius gigantellus*, in which the forewing is much darkened discally and with a number of deep black dots in the darkened area. It is named ab. *punctivittellus*. The rest of the plate figures *Cerostoma sequella* ab. *stygiella*, Esp. a very dark form, and the upper and underside of *Melitaea trivia* ab. *ardens*, Esp., showing extreme obsolescence of marking on both sides. They have both been described previously. Dr. Schawarda continues his articles on his experiences in Corsica in 1932; his eighth visit. Two plates illustrate this. Herr Skala discusses the *Nepticula* species on *Quercus pubescens*, on apple, on elm and on *Populus alba*, with figures of the mines. Plate six figures still another new form of *Parnassius apollo*. Three further plates illustrate an article by Herr Reisser on New Heterocera of the Atlas Region of N. Africa.

The very useful little French magazine, *L'Amateur de Papillons*, during the past few months has dealt largely with the Micro-lepidoptera. In this section the death of the Abbé Joannis has been a great loss. The editor writes an introductory article on the Collecting of Mines and subsequently Dr. Martin Hering contributes "Notes on a few French Micro-lepidopterous mines," and continues with an annotated List of Mines found in the Paris area. M. Praviel gives a List of captures at Nevache (Hautes Alpes) during several yearly visits with notes on the district and remarks on various species. There is a figure of *Papilio machaon* ab. *minor* from the Alpes Maritimes measuring 43mm. in expanse, and a photograph of an irregular union between *Erannis marginaria* ♂ and *Selenia tetralunaria* ♀. M. Marchand contributes an article on the Tortrices, of much importance apropos of the next section of the "Catalogue of French Lepidoptera" by M. Léon Lhomme. The present portion deals particularly with the first large group, the *Phaloniidae*. It is illustrated by diagrams. We congratulate the editor M. Léon Lhomme that he has been able to carry on for nearly twelve years and that he has got together such a panel of able helpers.

A file of the more recent numbers of the *Ent. Zeit.* contains among other matters, two articles on *Colias hyale*; the first deals with the general distribution of the species and notes the 20 forms met with in and around Regensburg (Zeller's old town) and contains a coloured

plate of 20 figs., the other article deals with the distribution of the same species in Western Europe. Researches in Lepidopterous hybrids are continued and there is a plate of *Celerio* forms; Herr Dannehl, with whose accounts of collecting trips one is familiar, contributes a series of notes on hitherto undescribed forms of European Lepidoptera in his collection; Herr Bang-Haas also gives a series of notes and descriptions of new forms of Palaearctic Lepidoptera; among the individual species discussed we note an unusual form of *Cidaria affinitata* in which the white band is totally effaced and the forewings have a dark outer half and a lighter inner half; the example was one of about 130 examples bred; it has been named *ab. jenischii*. Temperature experiments with *Aglais urticae* are illustrated with a plate.

A meeting of the Entomological Club was held at Eastbourne on Saturday, June 17th, 1933, Mr. Robert Adkin in the Chair. *Members Present in addition to the Chairman*:—Mr. Horace Donisthorpe, Mr. H. Willoughby-Ellis, Mr. Jas. E. Collin, and Mr. W. J. Kaye. *Visitors Present*:—Mr. B. W. Adkin, Mr. R. A. Adkin, Mr. H. W. Andrews, Dr. R. Armstrong, Major E. E. Austen, Mr. G. T. Bethune-Baker, Mr. E. C. Bedwell, Mr. K. G. Blair, Mr. G. V. Bull, Dr. M. Burr, Dr. E. A. Cockayne, Mr. C. L. Collenette, Capt. Dannreuther, Mr. T. Bainbrigg Fletcher, M. F. W. Frohawk, Mr. C. N. Hawkins, Col. F. A. Labouchere, Mr. H. Lankester, Mr. Hugh Main, Mr. A. L. Rayward, Capt. N. D. Riley, Mr. Edwin D. Sharp, Mr. W. Rait-Smith, Mr. W. H. T. Tams, Mr. J. R. le B. Tomlin, Mr. Henry J. Turner, Rev. Geo. Wheeler, and Mr. G. C. M. de Worms. On Saturday, the Chairman received the members and guests at the Grand Hotel at 12.45 for 1 o'clock lunch, which was served in the Private Room, at which 33 sat down. In the afternoon excursions were made to the Crumbles and to the Downs. The walks were interesting, but the wind much too high for collecting.

The company again assembled in the lounge of the Grand Hotel at 5.45 for the Club Supper at 6 o'clock, which again was held in the Private Room. After Supper the Chairman exhibited the original British specimen of *Nepticula decentella*, H.-S., together with another specimen recently captured. Both were taken in his garden at Eastbourne. He also had on view a photograph of the delegates to the Centenary Celebrations of the Royal Entomological Society of London recently held in London. Mr. Jas. E. Collin also showed some interesting Diptera. A most successful meeting concluded in time to catch the main line trains for London and elsewhere. Many of the guests were able to accept the Chairman's invitation to stay over the week-end, where accommodation was provided for them at the Grand Hotel. On Sunday, June 18th, cars left the Grand Hotel immediately after breakfast for a collecting trip at Whitefield Wood in fine weather, and a very enjoyable morning was spent in this well known entomological locality. After returning to the Grand Hotel luncheon was served at 1.45, and during the afternoon a visit was paid to the Chairman's house, "Hodeslea," Meads, where Mrs. Adkin dispensed tea. The Chairman's Library, which contains many rare entomological books, gave much pleasure; and after inspecting the garden, which was looking at its best, a business meeting of the Club was held. The Chairman gave a dinner party in the evening at the Grand Hotel at

which the ladies were present, after which the Concert given by the Grand Hotel Orchestra was attended. The Company dispersed on Monday morning after having spent a most enjoyable week-end.—H.W.-E.

REVIEWS AND NOTICES OF BOOKS.

The volume of *Transactions and Proceedings of the South London Entomological and Natural History Society* for 1932-33 (pp. xx. + 137, 9 tabs.; price 12/-), records excellent work carried out by the Society. The Proceedings of the various meetings contain numerous interesting notes on various insects, too diversified to summarize here. The Transactions include papers on *Boarmia repandata* and *B. rhomboidaria*, by H. B. Williams; on the eggs of the British Geometridae and of other groups included in South's second volume on Moths, by A. E. Tonge; on Plant Galls, by M. Niblett; whilst *Isturgia carbonaria* is the subject of two papers, one on its life-history, by Dr. E. A. Cockayne, and the other on its pupa, by C. N. Hawkins. M. and E. Stanley-Smith describe a home-made light-trap for Moths, which appears to have given good results, although perhaps of too elaborate construction for everyone to be able to apply the term "home-made" to his own trap made after this model. A paper by K. G. Blair, on Wegener's Theory of the Displacement of Continents, strikes a rather unusual note in a volume of this kind. It is difficult to summarize Wegener's book in a few pages and exigencies of space have doubtless restricted this paper to nine pages and one plate. A fuller summary, by W. E. Wait, will be found in the *Bombay Natural History Society's Journal*, XXXIV. 754-771, December, 1930, by those unable to consult Wegener's book, whilst a still later critical summary is included in J. A. Steers' *The Unstable Earth* (Methuen: 1932), which had not appeared at the time that Mr. Blair's paper was read. So far as the distribution of Insects is concerned, Wegener's theory certainly seems deserving of more consideration than it has received up to the present. So far as we recollect, only one entomological criticism of it has appeared, in a letter to *Nature* (CXV., 834; 30th May, 1925) by Mr. E. Meyrick, who concluded that, so far as concerns the Micro-lepidoptera, Wegener's hypothesis is disproved by facts, although he also considered that "there must anciently have been some better communication between South America and Africa, and that this was probably equatorial and southern." Wegener's theory, however, states that the disconnection between these two continents began at their southern extremities and that they were still united a little North of the Equator so late as the Eocene, so that on this point of view there seems to be no real disagreement. In a process of this sort, extending over millions of years, it seems unlikely to find many comparable relationships amongst existing genera, especially perhaps in the smaller moths which are peculiarly liable to be distributed to great distances by the upper air-currents, and it would seem that a study of the distribution of some of the geologically-older groups, especially those which are little adapted to distribution by natural causes (*e.g.*, the Phasmoidea) would be likely to throw a more correct light on Wegener's theory so far as insects are concerned.—T.B.F.

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EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to **Mr. Hy. J. Turner**, "Latemar," West Drive, Cheam.

Duplicates.—*S. Andrenaeformis*, Bred 1928, well set on black pins, with data.

Desiderata.—Very numerous British Macro Lepidoptera.—*J. W. Woolhouse*, Hill House, Frances Street, Chesham, Bucks.

Desiderata.—Species of Dolerina and Nematina sawflies not in my collection; list sent.—*R. C. L. Perkins*, 4, Thurlstone Road, Newton Abbot.

Duplicates.—*Albimacula**, *sparganii**.

Desiderata.—Ova of *D. oo. pupae* of *X. gilvago*, *D. caesia*. *A. J. Wightman*, "Aurago," Bromfields, Pulborough, Sussex.

EXCHANGES.—Living Eggs of *Catocala fraxini* and spones, exchange for butterflies of British Isles.—*C. Zacher* Erfurt, Weimar, Street 13, Germany.

Duplicates.—*Pyralina**, *Salicis*, *Ianthina**, *Orbicularia**, *Repandata* in variety, *Doubledayaria*, *Black rhomboidaria**, *Black virgularia** and others.

Desiderata.—*Hyale*, *Welsh aurinia*, *Polychloros*, *Tiphon Agathina*, *Lunigera*, *Lucerna*, *Neglecta*, *Diffinis*, *Populeti*, *Gothica v. gothicina*, *White Leporina*, *Tridens Putrescens*, *Littoralis*, *Typhae v. fraterna*, *Burea v. Combusta*, *Gilvago*, *Fulvago v. flavescens*, *Liturata v. nigrofulvata*. *Harold B. Williams*, Woodcote, 36, Manorgate Road, Kingston Surrey.

Duplicates.—A large number of species of European and Palaearctic Rhopalocera and Heterocera.

Desiderata.—All British species especially those illustrating characteristics of an island fauna. *Dr. Lör. Kolb*, München 54, Dachauer-str. 409, Germany, and *Franz Daniel*, München, Bayer-str. 77, Germany.

Desiderata.—Living larvae or pupae of *Lasiocampa quercus*. Also set specimens of same species taken before 1910 in Devon or Cornwall.

Duplicates.—*Pavonia*, set specimens or living stock: *Monacha*, ova: *ochroleuca*, *griseola*, *advenaria*, *juniperata*, *thetis*, etc.—*J. A. Downes*, 5, Trinity Road, Wimbledon.

URGENT.—Wanted English (Cumberland) *Erebia epiphron*. Adequate exchange will be made in European Lepidoptera.—*B. C. S. Warren*, 14, Avenue de l'Eglise Anglaise, Lausanne, Switzerland.

I am seeking an opportunity of exchanging Macro- and Micro-Lepidoptera with English collectors and beg to send list of duplicates.—*J. Soffner*, Trautenau (Bezirksbehörde), Bohemia, Tschechoslowakische Republik.

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MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. October 4th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. July 27th, August 10th, 24th.—*Hon. Secretary*, *S. N. A. Jacobs*, "Ditchling," Hayes Lane, Bromley, Kent.

The London Natural History Society.—Meetings first four Tuesdays in the month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through Members, or from the *Hon. Sec. A. B. Hornblower*, 91, Queen's Road, Buckhurst Hill, Essex.

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IMPORTANT

TO ENTOMOLOGICAL SOCIETIES and MUSEUMS.

BACK VOLUMES OF

The Entomologist's Record and Journal of Variation.

(Vols. I-XXXVI.)

CONTENTS OF Vol. I. (Most important only mentioned.)

GENUS *Acronycta* and its allies.—Variation of *Smerinthus tiliæ*, 3 coloured plates—Differentiation of *Melitaea aethalia*, *parthenie*, and *aurelia*—The Doubleday collection—Parthenogenesis—Paper on *Taeniocampidae*—Phylloxera—Practical Hints (many)—Parallel Variation in Coleoptera—Origin of *Argynnis paphia* var. *valesina*—Work for the Winter—Temperature and Variation—Synonymic notes—Retrospect of a Lepidopterist for 1890—Lifehistories of *Agrotis pyrophila*, *Epunda lichenea*, *Heliophobus hispidus*—Captures at light—Aberdeenshire notes, etc., etc., 360 pp.

CONTENTS OF Vol. II.

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Notes on a Visit to the Northern Transvaal.

By J. SNEYD TAYLOR, M.A., D.I.C., F.R.E.S.

During April of this year I spent ten days on a farm near Potgietersrust in the Northern Transvaal. The district is a very dry one, particularly so at present after several abnormal seasons of drought. Except in the kloofs among the mountains, the streams and river beds were all dry; here and there one found pools of water, but these were few and far between. The farm adjoins another named Makapan on which is situated Makapan's Cave, mentioned by W. L. Distant in his "A Naturalist in the Transvaal," published in 1892. The cave is high up on the side of a mountain gorge and is of large proportions. In 1854 the Chief Makapan and his tribe were besieged in the cave by an avenging party of Boers (a hunting party had previously been massacred by Makapan) and many hundreds perished from thirst inside. Distant found human relics in considerable numbers, but these seem by now to have disappeared, although there are still to be seen grinding stones, pieces of grass matting and numerous fragments of pottery. There is a delightful little stream running through the gorge, at the head of which is a fall of some three hundred feet. The vegetation in the gorge, in contrast to that of the open country, is most luxuriant and there are many trees of considerable height. Maiden-hair and other ferns occur in profusion along the banks of the stream, also a large species of arum lily. Above the falls bracken, very similar in appearance to that found on our hillsides at home, was seen growing among the rocks. Various species of *Aloe* abound, also the large candelabra-like *Euphorbia* or "naboom." Gorges, or kloofs, like the one described, are numerous among the mountains, otherwise the country is poor in vegetation. The grass is sparse and dried up, while there are not many trees with the exception of the typical *Acacia* thorn bush.

On the farm a number of bushman stones have been found. These are artificially rounded pieces of stone up to about ten inches in diameter, with a round hole pierced through the centre. They are of ancient origin and their purpose is obscure. One theory is that they were handles for sticks used as spades or hoes, to give weight to the latter. Another suggestion is that a piece of metal was passed through the hole, then bent back again, and the stone rolled backwards and forwards in an effort to thresh the grain, or even used on the end of a stick for the same purpose. Whatever the purpose of these stones, the present native inhabitants appear to be totally ignorant of it. There are also traces of iron smelting having been carried on on the farm, in the shape of fragments of clay pipes, presumably used for blowing on to the fire, and quantities of slag.

Probably on account of the dry conditions prevailing and the consequent sparsity of vegetation, in addition to the lateness of the season, insects were not particularly abundant at the time of our visit. Among the butterflies *Precis oenone*, L., var. *cebrene*, Trim., *Papilio demodocus*, Esp., and a few species of *Pieridae* and *Lycaenidae* were the most numerous. Very few moths were seen at light: of those observed *Phytometra orichalcea*, F., and the fruit-piercing *Sphinxomorpha chlorea*, Cram., predominated. The Sphingids, *Herse convolvuli*, L., and

Basiothia laticornis, Butl., were seen hovering over flowers. In the Makapan kloof one specimen of the large, hairy and handsome larva of the Striphnopterygid, *Janomina westwoodi*, Aur., was found feeding upon a species of shrub. I am at present endeavouring to rear it upon willow leaves, with which it is apparently satisfied.

The most interesting entomological feature of the farm, however, was the insect fauna of a large water tank situated close to the house. The tank is circular in form, the sides are made of corrugated iron, and the bottom is coated with cement. It measures 30 feet in diameter, the height is 4 feet 6 inches, while the capacity is 20,000 gallons. It is supplied by pipe from a small stream in one of the mountain kloofs, a mile and a half away. There is no aquatic vegetation in the tank save for a short coating of green alga on the sides and bottom. Beside the tank there is a young willow tree growing, a few of the branches of which dip into the water. In this bare tank, in which copper sulphate had been placed in order to keep down the growth of algae, in a parched district, and one and a half miles away from the nearest water, a tiny trickling stream, I was surprised to find quite an abundant and varied insect fauna.

The following is a list of the insects observed; unfortunately I have not yet succeeded in having all the species named.

<i>Coleoptera.</i>	<i>Dytiscidae</i>	: 6 species.
	<i>Gyrinidae</i>	: 1 species.
	<i>Hydrophilidae</i>	: 2 species.
<i>Rhynchota</i>	<i>Hydrometridae</i>	: 3 species.
	<i>Belostomidae</i>	: 1 species.
	<i>Nepidae</i>	: 4 species.
	<i>Notonectidae</i>	: 4 species.
	<i>Corixidae</i>	: 1 species.
<i>Odonata.</i>	<i>Aeschnidae</i>	: 1 species.
	Total	: 23 species.

I made a small collection and endeavoured to bring some of the insects back with me to Pretoria alive. All the *Coleoptera* survived, but the *Rhynchota* did not fare so well, the Belostomid, one of the Nepids, all the Notonectids and the Corixid dying on the journey.

By far the most numerous of these insects was one of the Notonectids, which literally abounded, while next in numbers came the Gyrinid of which some twenty to thirty individuals were to be seen disporting themselves in the sunshine. The Gyrinid was followed in point of numbers by one of the Hydrometrids, a species of *Gerris*. Apart from these three species none of the insects were observed in any numbers. In several cases only one individual of a species was seen, while in few did the number exceed six.

Of the *Dytiscidae* the largest, *Cybister tripunctatus*, subspec. *africanus*, Cast., of which two females were obtained, is about 30mm. in length. The dorsal surface, including the elytra, is olive green with a dull gold marginal band. This band at the anterior end of the elytra branches into two, and they continue to run close to one another to the posterior end where they join again. The under surface, as well as the third pair of legs, are dark brown. The first pair of legs is yellow with dark patches on the inner sides of the femora, while the femora of the second pair are yellow, the remainder being brown. Unlike *D.*

marginalis, the elytra are smooth, while the third pair of legs, the tibiae of which bear two strong spurs, are more paddle-shaped. It is a very active and voracious species, feeding readily in captivity upon grasshoppers, termites (*Termes badius*, Hav.), and raw meat. The next species in point of size, *Hydaticus flavolineatus*, Bohm., of which one male was taken, is some 19mm. in length, and its most obvious feature is a series of narrow longitudinal yellow stripes on the elytra given off by a broader horizontal one at the anterior end of each. These stripes fade away towards the posterior end of the elytra where there is a group of small yellow spots on each side. A somewhat smaller species, *H. bivittatus*, Cast., of which one female was obtained, is quite the most handsome of any of the Dytiscids observed. It is about 14mm. in length, the head is black, the pro-thorax orange with a short and broad black median bar on the posterior margin. The elytra are smooth and shiny black with a bright yellow marginal line bifurcating at mid length, the upper branch uniting posteriorly with another bright yellow band which runs the length of each wing-case, down the centre, from the anterior margin to the posterior. It is a most conspicuous object in the water, and is very wary, being more difficult to catch than any of the other species. It also appears to be less voracious than the others, although it readily feeds upon termites, and has not been observed disputing over food as is frequently the case with the others. Another species, of which one male was taken, is about 12mm. in length, and is generally dull coloured. The elytra are black with a dingy brown sheen, and there is a light yellow marginal band. A slightly smaller species, *Rhantaticus congestus*, Klug, of which two males and one female were obtained, is from 9 to 10mm. in length. The dorsal surface of the pro-thorax of the male is pale yellow with a black horizontal streak on the anterior margin and a similar one on the posterior margin, while that of the female is more orange and has two black horizontal streaks with a dot between across the centre in addition to the marginal streaks. The elytra, which are smooth in both sexes, are greyish brown to black with black markings in the shape of two broad irregular bands, one across the centre and one towards the posterior. In the case of the female these bands are more clearly defined while the general colour is somewhat lighter. The under surface of the thorax is light brown in both sexes, while that of the abdomen is darker, particularly in the case of the male. This species is most voracious and is frequently seen disputing over the termites of which all the soft parts are devoured. The remaining two species are very small, being some 3 to 4mm. in length, and I did not retain any living specimens. I have since found individuals of one in large numbers in a small stream in the vicinity of Pretoria. It hides under the grassy bank of the stream, and seems fond of crawling up the grass in the jar in which it is confined. It has been seen feeding upon termites, but is not sufficiently powerful to draw them under. The elytra are smooth and are streaked with gold, and also have patches of gold, one situated near the anterior margin, one towards, and one at the posterior margin. The other, a species of *Laccophilus*, is an inconspicuous insect with elytra of a dull greyish black colour.

In all the female specimens mentioned above the elytra are smooth while the hind legs are more paddle-shaped than in *D. marginalis*.

The former fact is interesting in view of Professor Miall's remarks in his "Aquatic Insects" in which he refutes the suggestion of Kirby and Spence that the elytra of the female are ribbed in order to aid the male in copulation. Miall states that the sculpturing of the elytra of female Dytiscids becomes less marked in southern countries.

The Gyrinid, *Dineutes aereus*, Klug, which is one of the most numerous species in the tank, is about 14 mm. in length, and is steely black in colour. I kept one specimen alive in a jar for some time, and it was frequently observed darting at and seizing living termites lying on the surface. After seizing a termite it could be seen chewing it and tearing it to pieces, and sometimes swimming violently about while doing so. After a moment or so the beetle would drop the remains of the termite and, following another violent swim, would frequently return to the charge again.

Of the *Hydrophilidae*, one species, *Hydrous senegaleensis*, Percheron, in size and colouring is very similar to the European *Hydrophilus piceus*, and the single specimen taken feeds on grass in captivity. It is also suspected of feeding upon termites as these, when placed in the jar with the beetle, always disappear. The other Hydrophilid, a species of *Regimbarcia*, is very much smaller, measuring about 5 mm. in length. It is black and shiny, and is without the long ventral spine of the larger species.

We now come to the *Rhynchota*. The Hydrometrids included two species of *Gerris*, one of which was fairly numerous. This is a comparatively large species, being about 12 mm. in length. It was frequently observed feeding upon flies, which had fallen on to the surface of the water, some of which were still quite active. One individual was seen feeding upon a species of Lygaeid. The other species, of which only one individual was obtained, is smaller. The third species, of which at least half a dozen individuals were observed, is a slender and delicately built insect not unlike *Hydrometra stagnorum* in appearance and size, but with wings. It runs lightly and in a series of short rushes over the surface of the water; it was sometimes observed at rest on the sides of the tank above the surface and under the shade of the overhanging willow tree, as well as on the twigs of the tree.

The single species of *Belostomidae* is *Lethocerus niloticus*, St., and only one individual, which unfortunately did not survive the journey to Pretoria, was seen. It was found late one night resting on the side of the tank a few inches below the surface. It is a massive and powerful looking insect, some 65mm. in length, and of a dull brown to black colour. I have one other specimen taken at light at Barberton, Eastern Transvaal, three years ago. While at Barberton I was informed that some people bathing in a dam in the neighbourhood were attacked by giant water bugs, presumably a species of *Belostomid* from the description given. I have no reason for doubting the veracity of my informant, but I should have thought that the insects would have been more anxious to escape from the bathers than to attack them. I heard no reports of insect attack in connection with the tank at Potgietersrust, which is frequently used for bathing.

Of the *Nepidae*, or water scorpions, three certain and one doubtful species were obtained. Of the three certain species two resemble the European *Ranatra* in shape and the other *Nepa*. The larger of the

two "*Ranatra*" measures some 96mm. from the tip of the rostrum to the posterior end of the respiratory tube, which itself is about 55mm. in length. It is a slender and elongate insect with long thin legs. The raptorial forelegs and the prominent eyes give it a somewhat Mantid-like appearance. It is dull coloured, the pro-thorax being light brown and the hemelytra light to dark brown. Two specimens were obtained and a few others observed. In the tank it was usually found on the sides near the surface or lying just below the latter, and it was also occasionally seen hanging on to the willow twigs projecting into the water. It is a sluggish species and swims in a slow and jerky manner. In several instances it was seen holding a small Notonectid with the forelegs. In captivity it remains, for the most part, below the surface in a slanting position, head downwards, with the second and third pairs of legs holding on to a plant and the end of the respiratory tube at, or near, the surface, while the forelegs are held laterally outwards ready to seize any likely prey that may happen to come along. It readily seizes termites dropped in front of it, and is very adept in doing so, whether the termite is towards one side, or straight in front. After grasping the termite between the tarsus and tibia, which, as stated by Miall, "can be folded like a clasp knife," the "*Ranatra*" brings the termite close to its head and pierces it with its rostrum. It remains thus feeding for a considerable time sometimes releasing its hold with one or both legs while the termite remains transfixed by the rostrum. Although I have not actually seen it happen, I have reason to believe that the "*Ranatra*" sometimes takes its prey from the surface. It has occasionally been observed picking a termite off the bottom of the jar until the tip of the respiratory tube comes in contact with the surface of the water. The other species resembling *Ranatra* is considerably smaller, and only one pair was seen. The pair was found *in cop* on one of the willow branches above the water late one night. The female is pearly grey in colour and some 48mm. in length, while the male is light brown and about 4mm. shorter. Neither survived the journey to Pretoria. The species resembling *Nepa*, of which two individuals were observed, measures some 106mm. in length, including the respiratory tube which occupies about 66mm. of the total length. The dorsal surface is greyish black, the ventral surface of the abdomen is of a dull red, and the legs are mottled. It is, of course, a much more massive looking insect than "*Ranatra*," and it has more of the look of a scorpion about it. In the tank it was usually seen on the side a few inches below the surface, or else swimming sluggishly on the latter. It feeds upon termites and grasshoppers in captivity and frequently spends several hours over a meal. To-day it spent about five-and-a-half hours clutching a grasshopper with its powerful raptorial forelegs and apparently feeding most of the time. The fourth, and uncertain, species was at first thought to belong to the *Naucoridae* on account of its general appearance and shape. Unlike the *Naucoridae*, however, it has a pair of retractile appendages, as in the *Belostomidae*, which are projected through the surface when the insect comes up for air, while the membrane is reticulate. A character which it has in common with the *Naucoridae* is slender and spinulose hind tibiae, while those of the *Belostomidae* are broad and flattened. Were it not for the hind tibiae I would be inclined to place it in the last-mentioned family. Mr. G. van Sonn, of the

Transvaal Museum, to whom I am much indebted for a number of determinations, considers it to be more nearly allied to the *Nepidae*. The insect concerned is about 13mm. in length, and is of a dull greyish brown colour with black markings on the hemelytra. It is a strong swimmer, and was found to frequent the sides of the tank and the willow branches touching the water. Four individuals were obtained, one of which punctured my finger. In captivity it feeds upon termites and spends most of its time at rest, head downwards, under stones and pieces of weed, coming occasionally to the surface for air.

Four species of *Notonectidae* were observed, one of which was the most abundant insect in the tank. This is a small species, some 7mm. in length. The scutellum is of a bright red colour, either wholly or in part, and the hemelytra are clear, while the abdomen, seen through them, has a silvery blue appearance. Two other species, of which only one individual of each was taken, are slightly larger and dull coloured. The remaining species is considerably larger and is also dull coloured. Only one specimen was obtained.

Of the *Corixidae* one individual of a small blackish species was taken.

There remains only the dragonfly to be mentioned, a species of *Aeshnidae*. Late one night, about 10 p.m., an adult was seen emerging on the side of the tank a few inches above the surface. By next morning nothing but the empty pupal skin remained. Several species of dragonflies were observed flitting about over the surface during the daytime.

At night, by flashing a torch on the surface of the water, one could see numerous small *Crustacea* swimming about. These, together with the small Notonectids, and the terrestrial insects fallen on the surface, probably form the main source of diet of the larger inhabitants of the tank.

Apart from the aquatic insects I came upon little of any great entomological interest. There are, however, two other items which are perhaps worth mentioning. The building in which I was quartered was a rondavel, the rounded walls of which consisted of mud bricks, whitewashed on either side, and with a thatched roof. In one or two places cracks had appeared on the outer side, and in one of these I found a specimen of a peculiar looking Reduviid nymph. The entire dorsal surface, the legs and part of the antennae are covered with particles of earth, probably from the bricks, while there are also some patches of whitewash on the dorsal region. Another specimen was found crawling on the wall late at night. When at rest the insect might easily be taken for part of the wall where some of the whitewash has flaked off. I have both specimens alive still and am feeding them upon termites to which they seem to be partial, in captivity at any rate. One cannot say, of course, if this is their natural food, but there were certainly termites at work in the walls and roof of the rondavel. Both specimens have now the remains of a considerable number of termites adhering to them, in addition to the particles of earth. On July 28th one of them moulted for the last time, and I have now been able to determine the species, which is an *Acanthaspis obscura*, St., a common species at light at Barberton.

The other incident was one illustrating the useful work which can be done by Coccinellids. On the farm there was a large field of kaffir-

corn (*Sorghum*) through which I walked on the day of my arrival, April 14th. The kaffir-corn was then heavily infested by a species of Aphid, presumably *Aphis sorghi*, Theo. This species frequently causes severe damage to kaffir-corn, particularly if the latter is planted late in the season. This crop, however, was planted early and the majority of the plants were almost ready for reaping before the Aphid got a hold and was able to do any damage. Several species of *Coccinellidae* were abundant in all stages, and I resolved to collect some material before returning to Pretoria as I am at present working on the biology of a number of species. On the day on which I left (the 23rd,) I again visited the field, and although I went through it carefully, I only succeeded in finding a few aphids, where nine days previously there had been millions. The natural enemies, of which *Coccinellids* predominated, had apparently wiped them out. The most abundant species, all of which are common and widespread, were *Chilomenes lunata*, F., *Cydonia quadrilineata*, Muls., and *C. geisha*, Gorb., which were to be found in all stages and in large numbers. They had certainly accomplished excellent work in a short space of time, but had the crop been a late planted one their efforts would have been too late to save it, which frequently appears to be the case, under natural conditions, with insect parasites and predators. A species of *Scymnus* and one adult of *Exochomus nigromaculatus*, Gze., were also observed, as well as a Syrphid which was fairly numerous.

Paris and Mouthier (Doubs.) in July-August, 1932.

By LIEUT. E. B. ASHBY, F.R.E.S., F.Z.S.

(Continued from p. 85.)

I left Paris on the night of July 23rd at 10.50 p.m. arriving at Pontarlier station next morning about 6.30, the train being late. I was met by the Auto from the Hotel "Le Manoir" at Mouthier (Doubs.) where I stayed for some weeks. Mouthier is situated in a valley about 19 kilometres to the north of Pontarlier, bounded on both sides by high spurs of the French Jura, and with a river, the Loue, rushing down the Valley. There are some pretty cascades in the neighbourhood, which is highly cultivated, with, however, some woods and a fair amount of unused land at a moderate distance, where there is a good variety of wild flowers. The scenery in general is decidedly pretty, and in spring, when many hundreds of cherry trees would be in white blossom, it would be still more entrancing.

The Hotel, an old Manor House, kept by Monsieur and Madame Müller, is quiet, very clean, and has a fine old terraced garden. Madame Müller looks after her guests in a very charming way, and there is a nice assortment of English and other books in the Grand Salon.

I spent July 24th and 25th in the near vicinity of Mouthier, on both days ascending twice by roads and paths, through vineyards and partially wooded areas to more rural country. *Polygonia c-album* and *Parnassius apollo* were in some numbers. I took the latter insect in fresh condition throughout the whole of my visit, and note that of the 32 specimens, which I brought back, 15 are definitely referable

to the form var. *pseudonomion*, Christ (mentioned by Wheeler in "Butterflies of Switzerland"). Two females (out of a total of eight), have practically no white pupilling inside the red spots on the upper-side of the hindwing; and two males are without white pupilling inside the upper two of the red spots on the upper side hindwing.

As Mr. Wheeler does not mention these forms, I do not know if they have been named. Perhaps some readers would very kindly inform me. I took also beautifully fresh specimens of *Argynnis aglaia*, *A. cydippe* (*adippe*); and *A. niobe* var. *eris*; *Polyommatus coridon* (about $\frac{1}{3}$ of the males of this species are referable to the form ab. *striata*, Tutt, in which the spots on underside are more or less joined into streaks); *Eugonia polychloros*; *Strymon ilicis*; *Leptosia sinapis*; *Erebia ligea*; *Coenonympha iphis*, and *C. arcania*; all in quite fresh condition. The Neuropteran *Osmylus maculatus* was in numbers in the late afternoon along a small stream to the left of the police-station. The following Coleoptera were also taken *Hoplia farinosa*, L. very abundant; *Stenopterus rufus*, L.; *Clythra laeviuscula*, Ratz.; *Melasoma populi*, L.; and *Byrrhus pilulus*, L.; the Plecopteran *Chloroperla grammatica*, Scop.; the Hymenoptera *Allantus perkinsi*; *A. dahlui*, Kl.; *Leionotus nigripes*, H.-S.; the Rhyncotid *Aeocephalus nervosus*, Schnrk., and the Geometer *Ortholitha bipunctaria* (this species was quite fresh all the time).

There are many footpaths besides the roads and tracks which wind up amongst the hills; and there is therefore a variety of walks. The one main road from Pontarlier through Mouthier down to Lods (where there is a railway station) was also productive, especially in the direction of Pontarlier after passing the Mouthier Cemetery. There is a certain amount of pasture land above the vine area on the Mouthier side of the valley and I imagine the still higher altitudes should be productive.

July 26th.—After very heavy rain throughout the night and for some hours in the morning I was unable to use my net much. The following Coleoptera were taken, viz., *Carabus auratus*; *Leptura bipunctata*; *Strangalia melanura*; *Stenopterus rufus*, L.; *Silpha obscura*, L.; *Melasoma populi*, L.; a beautiful ♂ of *Carabus monilis*, F.; *Cryptocephalus sericeus*, L.; *C. violaceus*, Leach.; *C. hypochaeridis*, L. male and female in cop.; *Pterostichus vulgaris*, L.; *Phyllobius urticae*, De Geer, and 3 specimens of *Chrysomela cerealis*, L.; the Rhyncotids *Graphosoma italicum*, Much., a pair in cop.; and *Carpocoris fuscispinus*, Boh., a pair in cop.; and the Hymenoptera *Halictus zonulus*, Sm.; *Bombus halperanus*, a worker var.; *Megalodontes klugi*, Leach. (This beautiful insect, new to my collection, was very common everywhere during the whole of my visit, I usually boxed it when feeding, and I found it on the blossoms of many flowers.) I took also the "Burnet Moths" *Zygaena transalpina*, which was common; a single specimen of *Z. transalpina* var. *occidentalis*, a few specimens of *Zygaena filipendulae* and a single specimen of *Z. meliloti*, Esp.

A single specimen of *Polyommatus damon* quite fresh was the only example of the species seen during my visit. A *Satyrus* (*Hipparchia*) *hermione* was also taken. I ascended this afternoon towards the heights of Haute Pierre and collected in a wood on the hillside some way below these summits, where I found a single male specimen of the "Fritillary" *Melitaea didyma*; and the Tortrix moth *Cacoecia podana*, Scop.

July 28th.—After a period of bad weather and only intermittent collecting, it cleared up and the sun shone all day. As so often happens, the main road (towards Pontarlier) has proved productive and this in spite of frequent motor traffic, this being the only through road. Passing the police station on the right and the Cascade on the left after a short distance, a large sloping field of uncut grass and thistles opened out on left of the main road. This field produced *P. apollo* (which also appeared along the main road); *A. adippe* (*cydippe*); *A. aglaia*; *A. niobe* var. *eris*; *Brenthis ino*; *Erebia ligea*; and *E. aethiops* var. *violacea*; *C. iphis* ♂s and ♀s; also odd specimens of *P. coridon* together with a fine specimen of *Plebeius medon*; and on the way back one specimen of the geometer moth *Gnophos lignicolor*=*furvata*, W.F.; a male and female of the pretty beetle *Trichodes alvearius*, Fabr., also the beetles *Pterostichus transversalis*, Strm.; and *Cryptcephalus aureolus*, Suff., the Diptera *Eristalis tenax* and a single *Chilosia pebonata*, L.W. (not represented in the Brit. Museum). The following species of Hymenoptera were also met with.—*Hylotoma cyanocrocea*; *Nomada ochrostoma*; *Ctenopelma mesoxantha*, Grav.; *Euxochileum circumflexum*, L., ♀; *Anomalon xanthopus*, Scla.; and *Campoplex pugillator*, Grav. ♀.

July 29th.—This afternoon I descended to the River Loue and crossed over the only bridge at Mouthier-bas. A specimen of *Apatura iris* not wishing to be caught made away and I ascended the road to the right behind the only house, shortly afterwards leaving the road and taking a path on left parallel to a hedge which led long upwards in the direction of two large masses of crag, I ascended gradually through the woods between these rocky masses by means of the road which I had by now regained. This road leads on and upwards passing on left a clearing where *Erebia ligea* was in some abundance. Much further on, on the right is another but much larger clearing where *E. ligea* and *B. ino* were in some abundance amongst numbers of commoner insects. The view from this large clearing revealed pastures in the distance on top of such other rocky heights and at least one village, which cannot be seen at all from the valley at Mouthier. I also took a fresh specimen of *Strymon spini* and the Hymenoptera *Zaraia fasciata*, L.; *Amblyteles uniguttatus*, Grav. ♂; and *Tryphon elongator*, Fab. ♀; also the Coleopteron *Silpha obscura*, L.; and the Geometers *Coremia ferrugata* (*unidentaria*); and *Acidalia nigropunctata*, Hufn. (*strigilaria*, Hb.).

July 30.—The heat now became great. I spent this morning along the main road in the direction of Pontarlier. The new insects noticeable on the wing to-day were males of *Dryas paphia* and of *Polyommatus hylas*. I was close to a fine *A. iris* but missed it by an inch. *P. apollo* is very frequent all along the road and nearly always in fine condition and *C. iphis* ♂s are not infrequent. I descended the path leading to the Source Pontet, but I did not find it very productive. I took the Crambid moth, *C. pinetellus*, L. and the Coleoptera *Hippodamia variegata*, Goetz.; *Agapanthia cardui*, L.; and *Rhizotrogus fuscus*, and 2 males and 2 females of the Hymenoptera *Halictus calceatus*; and 1 specimen of *H. calmentaria*, Gerst.; and 2 specimens of *H. fulvicornis*, R.; and the Rhyncotid *Adelphocus seticornis*, F.; and a species of Trichoptera, *Odontocerum albicorne*, Scop.; one specimen of the Dipteron, *Syrphus lasiophthalmus*, Zt.

August 2nd.—After another period of hard rain with thunder, I started this morning in good time and carrying my lunch to walk up to Haute Pierre with a view to ascend to the Cross on the Crag behind the small village there. It is not a long walk as the crow flies, but uphill all the way. The sun hardly shone to-day and the long grass on the heights was extremely wet; still I was lucky to get there moderately cool. The heat of the atmosphere started insects flying towards midday and I secured a nice bag of the following: a male *P. machaon*, just emerged; a pair of *P. apollo* in cōp.; *C. satyrion*; one specimen of *H. sertorius* (sao); 4 females of *Thecla spini* in good condition; males and females of *H. hermione* smaller than those from Digne; the moth *Plusia gamma* was extremely common everywhere by day and night. Blues were extremely scarce with the exception of odd specimens of *P. coridon*, males. *M. galathea* was everywhere and I took one fresh male of *Zygæna carniolica*, the only one seen. I also took 2 specimens of Hymenoptera *Abia candens*, Kono.; also *Sphecodes pilifrons*; *Coelioxys acuminata*; *Perispadus sulphuratus*, Grax., ♂; *Geotrupes vernalis*, L.; *Lagria hirta*, F.; *Cryptocephalus aureolus*, Suf.; and *C. hypochaeridis*, L.; the Rhyncotids *Syrmaestes marginatus*, L., pair in cōp.; and *Aphrophoria alni*, Fall., also a pair in cōp. and *Adelphocoris seticornis*, F., var.; the Dipteron *Chrysotoxum arcuatum*; and the very beautiful Geometer *Ortholitha moeniata*, Scop.; of which I secured several more specimens during my visit. I took a very interesting Noctuid moth *Oligia captivuncula*, Treit., new to my collection. Kirby states that the British form of this moth, *expolita*, Staint., is common at Darlington and Galway.

August 4th.—To-day as on July 29th, I crossed the river Loue and ascended to and between the two large masses of rock which are seen immediately facing the garden of the Hotel du Manoir. This walk is known locally as "Le Moine," from the large piece of rock seen standing up singly amongst the crags, with something of the appearance of a capuchin monk. To-day I kept on the road all the way, not taking the path up through the fields, but where the road bifurcates taking the left hand fork. It was again hopeless as to weather. The only interesting items to be noticed were the advent of a perfectly fresh male of *Lycaenopsis argiolus*; a single specimen of *Aphantopus hyperantus*, var. *arete*; a ♂ *Adopæa flava* (*thaumas*) and the ichneumon wasps *Cratichneumon dissimilis*, Grav., ♂; *Ichneumon confusorius*, Grav. ♂; and *Eurylabus tristis*, Grav. ♂; the Rhyncota *Centrotus cornutus*, L., *Calocoris norvegicus*, Omel.; together with the Coleoptera *Silpha tristis*, Illig.; *Chrysomela fastuosa*, Scop.; and *Carabus auratus*, L., and the Neuropteran *Chrysopa perla*.

August 6th.—The weather has at last cleared up after two days of almost incessant rain. This morning I went in the direction of the crag, "Le Moine," as on August 4th, but instead of walking up through the woods between the two ranges of crags, I took a rough path at the top to the right through fields and eventually, some distance on, I struck the road which leads from Lods to Longeville and walked along it towards Longeville. Along this road I took *P. polychloros*; *E. ligea*; and I saw several *A. iris* including one beautifully fresh female, but I failed to secure any. I was struck by the number of *Araschnia levana* form *prorsa* in the ascent this morning, and again this afternoon on the main road, on the way back between the wood

factory at Lods and Mouthier, where I also took a beautifully fresh male specimen of the Dragon Fly *Calopteryx splendens*, Harr. The *Erebia aethiops* of the form ab. *violacea*, Wh., has also appeared to-day, and I took 2 specimens in perfect condition. Descending from the Longeville Road on the way back, by a side path on the right, which passes through woods to Lods, I took a single specimen of *Pararge aegeria* form *egerides*, similar to our English form. To-night a very fresh specimen of the moth *Notodonta dromedarius* was captured at the electric light in my bedroom. During the day I secured specimens of the Rhyncota *Lepyronia coleoptrata*, L. ♂, and of *Adelphocoris seticornis*, F.

August 9th.—After two days of sickness I have been able to resume operations. I walked up fairly early to "Le Moine," the crags denoted by "Rochers du Capucin" on the map, Carte de France au 50 000e, Type 1922, Ornans, obtainable at Stanfords, London. On the way up I took a male and female of the *prorsa*, which is now more abundant; near the woods towards the top I took the first female of *P. coridon* which I have seen, and several more *Erebia aethiops* var. *violacea*, Wh., which are absolutely fresh; a perfect female of *A. paphia* with rather extra large black spotting; and on the way down near to Bas Mouthier, a single specimen of *Apatura ilia*; and of the Coleopteron *Ocybus cyaneus*, Pk.

(To be concluded.)

Zygaenae, Grypocera and Rhopalocera of the Cottian Alps compared with other races.

By ROGER VERITY, M.D.

(Continued from page 109.)

Aglais urticae, L. race *opima*, Vrtty.: Oulx (a few, in very fresh condition, at the beginning of July and then not seen again, so that the second generation, which is usually believed to be produced at low altitudes in the region of the Alps, presumably emerged at the end of August, after my departure); Clavières, on July 29th.—The materials I have collected from all sorts of localities in Europe, since describing my *opima* from the Baths of Valdieri, 1400m., in the Maritime Alps, and from Puybilliard, in Vendée, show that the form I have so named is by no means the most usual and characteristic one in the southern parts of Central Europe. As far as the Alps are concerned, my only specimens, which agree with it, are those of Oulx, and I have no others from the Western Alps to see whether this is usual there, but from the Vaud and the Valais to the Carnic those I have invariably found, on both watersheds, are *urticae*, which do not differ, on an average, from the nominotypical Scandinavian and the broadspread form of Central Europe. The characteristics of *opima* are the lighter, yellower and brighter tone of red, and the reduced extent of the black markings and notably the smaller size of the two dots on the disc of the forewing and of the one near their hindmargin, together with a considerable reduction of the yellow patch on its outer side and the narrower, lighter and outwardly shaded and indistinct black zone at the base of the hindwing. It thus is distinctly intermediate between nominotypical *urticae* and *turica*, Stdgr., which, in its turn, is a near approach,

but never a complete transition, to *ichnusa*, Bell., quite exclusively and constantly proper to Corsica and Sardinia, and never occurring anywhere else, even individually. The same cannot be said of *turcica*, as, notwithstanding it is in Asia Minor a very constant and distinct race, it occurs individually in Peninsular Italy and even racially in some localities there, such as Oricola and Mt. Cavo, on the boundary between the Latium and the Abruzzi, besides being racial on Mt. Parnassus, in Greece, as stated by Staudinger in *Horae Soc. Ent. Ross.*, VII., p. 57 (1871), where he describes it from Brussa, in Asia Minor. In our "Annotated List of the butterflies of Peninsular Italy" (*Ent. Rec.*, 1924, p. (43)) Querci and I applied the name of *turcica*, in a general way, to the *urticae* of this country, but, now I have been able to compare them with the race of Anatolia, I find this to have been quite a mistake, for the usual form stands much closer to *opima* and, apart from extreme variations similar to *turcica*, it chiefly differs from my typical one by its slightly smaller average size, so that the proper name for the race of the Apennines and, strange as it may seem, also for that of the Caronie Mountains, in Sicily, is *opima*.

To establish the position of these races in connection with each other and to try and infer their history from their present distribution, one must take into account the handsome Iberic race, which Sheldon has described from the region of Albarracin and named *teruelensis*. Its author points out its resemblance to *ichnusa* by "the richness of the tawny ground colour," and to this one might add the "almost total suppression of pale patches in the tawny bands, especially the one nearest the anal angle of the superiors," which he gives as a feature too. On the other hand, Sheldon also says, very rightly, that it is a well marked geographical race, which approaches by its large size and other characteristics the Chinese race *chinensis*, Leech. This connection does not surprise one, considering the well known resemblance of several Iberic races to those of the far East, such as that of *bejarensis* to *coreana* in *Lycaeides* [= *Plebeius*] *argus*, that of *chlorodippe* to the *vora* and *pallens* group in *Argynnis adippe* [= *cydippe*] or that of true *occidentalis*, Hüb., to *pekinensis* in *Melitaea didyma*; *teruelensis* would, according to the general hypothesis about this phenomenon, be one of the early Miocene migrators, but not one of the first subtropical group, which went from the Himalaya to Morocco, because it does not exist in Africa nowadays, so that it more probably passed, in this case, by the Northern Mediterranean route to Spain; these species are supposed to have survived the Glacial Periods and preserved their Asiatic facies along the Atlantic coast, which was then considerably nearer the warm current of the Gulf-stream than it is now. The successive grades of variation represented by *opima*, *turcica* and *ichnusa* can very well be supposed to have been derived, too, from Miocene stocks, but from the later migratory flows, the latest of which brought the moufflon to Asia Minor, Sardinia and Corsica, and which often underwent transformations in the various parts of the Mediterranean region, for we have a strikingly parallel case in the much greater ones of *Epinephelidi*, whose common ancestor is, apparently, *janivroides*, H.S., of Morocco, and from which *ida* and *tithonus* have been derived, on the one hand, and *jurtina*, *telmessia*, *cypricola* and *nurag*, corresponding, on broad lines, to the distribution of the *urticae* races, have been derived on the other. I notice, in this respect, that one of the specimens of *teruelensis* figured by Sheldon

points distinctly to *opima* by the small size of its black spotting; I have similar ones from the Pyrenees and Oberthür records two *urticae*, he captured at Cauteret, with extremely small dots on the disc of the forewing. Also the unusually large size and aspect of my *opima* from Vendée, as compared with the *urticae* of that latitude in Europe, can be accounted for by a strain of the same origin as that of *teruelensis*, that region being well known for the presence of some southern species, such as *Dryas (Argynnis) pandora*, and for the Iberic facies of others, such as *Epinephele jurtina*, which recalls *hispulla*, and, furthermore, a single specimen from St. Côme Bazas, in the Gironde, quite giving one the impression of being an actual *teruelensis*.

The conclusion, one comes to, is that there remains a doubt as to whether *teruelensis* is a remnant of the Southern Exerge, but that it more probably must be referred to the same Central one as *opima*, *turcica* and *ichnusa*. The branching of the Central and of the Northern Exerges in Asia is as about as difficult to make out exactly here as in most species: the divergence, apparently, began at a stage of evolution of the *urticae* phylum, similar to *chinensis*, Leech., *nixa*, Gr.-Gr., and *milberti*, Godart, characterised by the fact they all three still retain the entirely darkened underside of the forewing, as it is in *rizana*, Moore, and in *caschmirensis*, Koll., which are a stage further back and connect *urticae* also by other features to the *Eugonia* and especially to *californica* and by this underside feature to *io*, *antiopa*, etc., as well. The separation of the *milberti* phylum and of the *urticae* one evidently followed on that of the *Aglais* and the *Eugonia*, and probably took place long before any were *Vanessidi* and they still resembled the *Phyciodes*. Race *ladakensis*, Moore, so strongly recalls *milberti* on the upperside and seems so well connected to it by the newly discovered race *obtusa*, O.B.-H., of the Tatung Valley, in the N.-W. of the Kan-su province of W. China, described as exhibiting such an extensive dark pattern that the tawny ground-colour is only left uncovered in part of the cell of the forewings and in a narrow submarginal zone of fore- and hindwing, that one is tempted on the strength of the well known resemblance of other butterflies and animals of the Himalaya to Nearctic ones, such as that of *Parnassius himalayensis*, Elwes., to *smintus*, Doubl., to believe in a more or less direct connection and common origin, followed in Asia by a transformation somewhat parallel to that of true *urticae*, as it develops from *caschmirensis* and *rizana*, through *chinensis* and *nixa*, and acquires the characteristic white underside of the forewing, which *ladakensis* has too. Groum-Grshimailo describes in the *Mém. Romanoff*, vol. IV., p. 425, the gradual transformation in the Pamir, of his *nixa* from the Darvaz, through specimens from Artcha-Bach, to perfectly nominotypical *urticae* in the Transalai Mts, near the Myn-Djar river. His description of *nixa* in which the lack of blue on the forewing and the broad dark shade along the marginal band of the hindwing, suggest that also the peculiar melanic race *connexa*, Btc., of Japan has derived from a similar ancestry. This would complete the history of the Northern Exerge; that of the Central one, derived from the more gaudy *chinensis*, as described above, is very much parallel to it, except that it is carried much further, by the reduction of the black markings on both surfaces, culminating in *ichnusa*. The scale of variation in the extent of the dark pattern, from *milberti* to this extreme opposite degree (a character they, nevertheless, have acquired in common is the loss of the

two black spots on the disc of the forewing) apparently takes place, following a very general law and corresponding, for instance, to the scale of the allied tropical genus *Junonia* = *Precis*, from the Nearctic *lavinia*, Cr., whose pattern recalls, on broad lines, that of *milberti*, and from the female of the Asiatic *orithya*, L., to the very scantily spotted *alnana*, L.

Grapta c-album, L. race *c-album*, L. : Oulx.—I have spoken in the *Ent. Record*, 1919, p. 199, of the two generations of this species and of the confusion that some writers have made in this connection, including unfounded doubts about their perfectly constant and marked distinguishing features. The following data, obtained at Oulx, correspond to what I have seen in many other localities of the Alps, from the Baths of Valdieri, in the Maritime ones, to the Vaud and the Valais and to the Carnic Alps. The confusion, as far as I can make out, has arisen from the fact that, in the Alps and, I presume, also further north, individuals of the first generation are still on the wing when the second emerges and shows itself for a few days before retiring to its winter quarters. In Peninsular Italy things are clear, because this does not happen: the hibernated individuals fly in March and April, their offspring constitutes a first generation in June and at the beginning of July and the second generation only emerges and shows itself, in the usual transient manner, at the end of August and in September. At Oulx, instead, I saw, but failed to capture, at the end of June some individuals, which I take to have been fresh and active examples of the first generation *hutchinsoni*, Robson; I then caught a worn female of this form on July 23rd, another, very old one, on August 10th, and a similar male on the 12th. In the mean time, I collected several specimens of both sexes of the hibernating nomino-typical form, with black undersides, so freshly emerged that their wings were still flimsy, from July 27th to the 31st, and, after these five days, I saw no more, although I was on the look out for them in all the usual and in other likely spots of the neighbourhood, until August 17th. The two points one would like to ascertain are whether the emergence of the last days of July actually is constituted by the offspring of the June one, which is nearly certain, as 24 to 28 days is just the time required by many butterflies of all sorts to develop from the day the egg is laid to the emergence of the imago from the chrysalid, and what happens to the offspring of the very late females of the first generation; presumably, they produce other broods of the second generation at the end of August and in September, but at Oulx there happened to be a long interval between the early emergence I witnessed and these late ones, so that I came across no others before leaving.

SCIENTIFIC NOTES AND OBSERVATIONS.

THE TRUE HABITAT OF *GYROPHAENA LUCIDULA*, Er., AND *G. CONVEXICOLLIS*, Joy.—These two small "Staphs" are usually recorded from damp places, by beating faggots in marshes, etc., and not in fungus as with the rest of the genus.

G. lucidula, Er.—Fowler writes—"In flood refuse, etc., in marshy places"; and in the supplement we add—"In damp sticks." Joy recorded, however, that he once took it in two small white fungi on a

water-soaked log. Ganglbauer says in tree fungi and in damp leaves.

G. convexicollis, Joy.—Joy says that it occurs in marshy places as with *G. lucidula*, and that he took a few specimens in flood refuse, and that Walker had found it among wet dead sticks. I have taken both these species sparingly in Windsor Forest, in flood refuse, by sifting damp moss, and by beating what was left of faggots of former years. This year however I discovered a small fungus growing on the roots of the willows in a willow-swamp and captured a fair number of both species, which were living in these fungi.

Mr. Ramsbottom tells me the fungus is *Lentinus trigrinus*, and that the roots of willows in swamps are its usual habitat.—HORACE DONISTHORPE, British Museum (Natural History), 12.vii.33.

NOTES ON COLLECTING, etc.

NOTES ON MIGRATORY SPECIES OF LEPIDOPTERA (MAINLY SURREY).—A short summary of the records which have been received may be interesting. Perhaps the most noteworthy is a record from Timoleague, Co. Cork, Ireland, of the capture of both *Pyrameis cardui* and *P. atalanta* on March 29th, the weather being "warm for the time of year." Another record is that of *Polygonia c-album* on April 10th and 13th, near Chiddingfold and Pitch Hill respectively with the note from the observer "I consider this species as an 'immigrant' from the West Country. It first appeared in my garden in August, 1929, and has visited the Buddleia every autumn since. This year I have seen it in spring for the first time. Weather fine and warm." An observer from Haslemere, records the capture of 4 *Macroglossum stellatarum* in mid June. The rest of the records received relate to *Pyrameis cardui* (13) and to *P. atalanta* (7). The former species was seen first at Ashted, Surrey, on May 20th and on May 21st at Eltham, and so on till July 18th, after a month had elapsed from June 23rd. One observer notes the species in his garden at the end of May. The latter species was recorded on May 6th at Ashted and so on through May and June. *Plusia gamma* has only been recorded from Haslemere, June 4th and 5th, both examples in good condition. A report has appeared in the *Eastern Evening News* that on June 3rd, 4th and 5th there was a considerable immigration of *Pieris brassicae* and *P. rapae* arriving at Scolt Head from the E. and N.E.—HY.J.T.

THE SEASON 1933.—During the present month of July I have noted in this neighbourhood that *Polygonia c-album* is common in the form *hutchinsoni*. *Pyrameis cardui* has been fairly common with odd specimens of *Colias croceus* (*edusa*). *Limenitis sibilla* has also been common.—G. S. ROBERTSON (M.D.), Storrington, Sussex, 25.vii.33.

REVIEWS AND NOTICES OF BOOKS.

Part 40 of the *Supplement to Seitz Palaearctic Fauna* has recently come to hand. In the three sheets is contained a considerable amount of matter useful to and of interest to the English lepidopterist. Concerning *Habrosyne deversa*, reference is made to the discovery by

Houlbert, (mentioned by us in our notes on the species in *Sup. to Brit. Noct.*) that the prior name is *pyritoides*, Hüfn., and published a year before Linne's *derasa*. Dr. Seitz remark is "As a redenomination would lead to an immense amount of confusion; we are retaining the name (*derasa*)."
Thyatira batis has five newly described forms; *Palimpsestis fluctuosa* has one; *P. duplaris* has four; *P. or* has fourteen; Dr. Seitz here refers to the synonymy of this species and says, "The fanatics in the question of priority have not been able to lodge any definite claim."; *P. ocellaris* has four; *Polyplocia diluta* has three; *P. flavicornis* has nine; *P. ridens* has four; and *Diloba caeruleocephala* has three. Many of these forms are illustrated on the plates. It is said that "The name "*ridens*" (Latin for laughter) has nothing to do with the bright coloration, which some continental authors seem to indicate, but with the markings of the head of the larva which has a 'deriding' look." The relationship of this species to other Heterocern is so uncertain that it has been suggested to create a new family for it, *Dilobidae*. While referring to the *Supp.* to Seitz. it may be as well to mention that the other, main volumes, are progressing slowly, probably as slowly as subscribers are prepared to pay for them under the present difficult times. Current numbers of Vol. X. deal with Indo-Australian *Cossidae*, (*Zeuzera*, *Xyleutes*, etc.) and *Phagmataecia castaneae* is discussed with five exotic forms. Vol. VI: the American Bombyces are continued with a plate of *Sphingidae*. Vol. XII: 2 sheets and 4 plates of Indo-Australian Geometers are just issued for which our friend L. B. Prout is responsible. There are some 250 figs. on the plates mostly the green coloured species.—Hy.J.T.

BRITISH BEETLES: Their Homes and Habits. By Norman Joy, M.R.C.S., L.R.C.P., F.R.E.S., M.B.O.U. Messrs. F. Warne & Co. 5/-.—The book before us is one of those elementary teaching-books of Natural Science of which so many are being issued in the present age mostly by "book-makers" whose practical knowledge is almost nil. The author of the present work has been, on the contrary, a very well known field-worker for many years past and whose writings should be the outcome of his life-long experiences. After a short introduction the author treats of his subject in a series of chapters on the principal groups of the Coleoptera in a chatty manner. The novelty of the treatment lies in the brief remarks with figures on the larvae of Coleoptera, which is further advanced by four plates of life-histories by the well-known exponent Mr. Hugh Main. The text is further illustrated by a series of plates occupying nearly half the volume with many outline figures (enlarged) of common species illustrative of the various sections dealt with. This method of illustration has been adopted previously but whether the young collector can recognise a small beetle by a large diagram can only be settled by the collector himself. We would have preferred the plates to have been made from photographs the natural size such as those in W. E. Sharp's little books some years ago. To deal with over 3000 British species in a small book is, of course, impossible. The object of this book is "to stimulate interest" in one of the orders of the insect world, upon whose control the wellbeing of the human race depends. As is usual with our British Publishers, Messrs Warne have done well.—Hy.J.T.

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Duplicates.—*Albimacula**, *sparganii**.

Desiderata.—Ova of *D. oo. pupae* of *X. gilvago*, *D. caesia*. A. J. Wightman, "Aurago,"
Bromfields, Pulborough, Sussex.

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British Isles.—C. Zacher, Erfurt, Weimar, Street 13, Germany.

Duplicates.—*Pyralina**, *Salicis*, *Ianthina**, *Orbicularia**, *Repandata* in variety,
Doubledayaria, *Black rhomboidaria**, *Black virgularia** and others.

Desiderata.—*Hyle*, *Welsh aurinia*, *Polychloros*, *Tiphon Agathina*, *Lunigera*,
Lucerneae, *Neglecta*, *D. finis*, *Populeti*, *Gothica v. gothicina*, *White Leporina*, *Tridens*
Putrescens, *Littoralis*, *Typhae v. fraterna*, *Rurea v. Combusta*, *Gilvago*, *Fulvago v.*
flavescens, *Lituratora v. nigrofulvata*. Harold B. Williams, Woodcote, 36, Manor Gate Road,
Kingston Surrey.

Duplicates.—A large number of species of European and Palaearctic *Rhopalocera*
and *Heterocera*.

Desiderata.—All British species especially those illustrating characteristics of an
island fauna. Dr. Lor. Kolb, München 54, Dachauer-str. 409, Germany, and Franz
Daniel, München, Bayer-str. 77, Germany.

Desiderata.—Living larvae or pupae of *Lasiocampa quercus*. Also set specimens of
same species taken before 1910 in Devon or Cornwall.

Duplicates.—*Pavonia*, set specimens or living stock: *Monacha*, ova: *ochroleuca*,
griseola, *advenaria*, *juniperata*, *thetis*, etc.—J. A. Downes, 5, Trinity Road, Wimbledon.

URGENT.—Wanted English (Cumberland) *Erebica epiphron*. Adequate exchange
will be made in European Lepidoptera.—B. C. S. Warren, 14, Avenue de l'Eglise
Anglaise, Lausanne, Switzerland.

I am seeking an opportunity of exchanging Macro- and Micro-Lepidoptera with
English collectors and beg to send list of duplicates.—J. Soffner, Trautenau (Bezirksbehörde),
Bohemia, Tschechoslovakische Republik.

CHANGE OF ADDRESS.—T. Bainbrigge Fletcher, R.N., F.L.S., F.Z.S., F.R.E.S., to
"Rodborough Fort," Stroud, Glos.

S. G. Castle-Russell, to "The Homestead," Crawley, Winchester, Hants.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7.
8 p.m. October 4th.

The South London Entomological and Natural History Society, Hibernia
Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m.
Sep. 14th, 28th, Oct. 12th.—Hon. Secretary, S. N. A. Jacobs, "Ditchling," Hayes
Lane, Bromley, Kent.

The London Natural History Society.—Meetings first four Tuesdays in the
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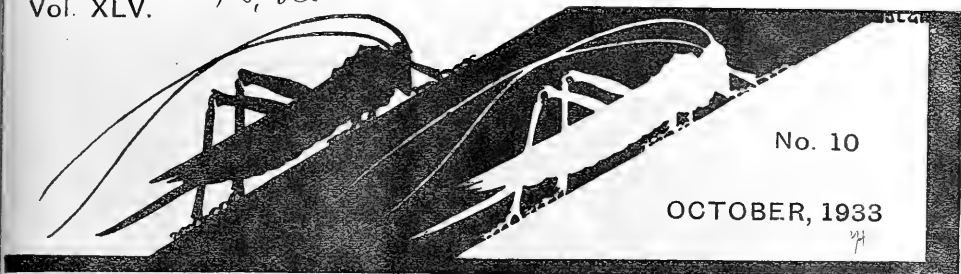
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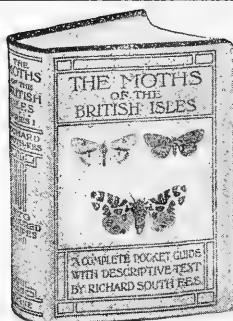
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The flowery field at Ryömälä where many species were obtained.



The railway bank at Savonlinna where *M. maturna* and the very small specimens of *B. selene* occurred.



A corner of the Bog at Kankarijärvi, where
B. arsilache was first taken.



The moss at Ahvenusjärvi, where *C. palaeno* and
B. aphirape race *ossianus* fly.

A Butterfly Hunt in South Finland. (With 2 plates.)

By Rev. G. WHEELER, M.A., F.R.E.S.

Finland appears to be almost an unknown land to British Lepidopterists, partly, at any rate, owing to the wrong impressions of the country which seem to be prevalent. Finland is *not* (as a rule) cold, it is *not* flat, and it is very far from being uncivilized. It is true that it is subject to sudden changes of temperature, but the cold in June is not extreme, nor is the out-door heat at all unbearable, being generally tempered by a cooling breeze, and rarely much exceeding 80° Fahr. There are no mountains in the south of Finland, but on the other hand there is very little flat country; the general surface is hilly, the highest hills only reaching about 500 ft., and 200 to 300 being much more usual. There are lakes large and small in every direction, the neighbourhood of which is often marshy, and these marshes afford the best collecting ground for the most characteristic forms.

The butterflies on the whole turned out to be rather disappointing, as, with two exceptions—*Brenthis aphirape* race *ossianus*, and a single specimen of *Carterocephalus silvius* ♀—no specially northern species were found.

I left England in company with Dr. and Mrs. Scott of Ashford on June 21st, crossing from Hull to Helsingfors where we arrived in the early morning of the 26th, having stopped at Copenhagen from 6 p.m. on the 23rd till noon the following day. I had hoped to obtain one or two Danish specimens of some sort, but did not see a single butterfly, though we passed some hopeful looking spots in driving round Copenhagen in the morning. One of these might easily have been visited on our return journey, when we remained for six hours, but it was unfortunately a pouring wet day.

After depositing our baggage at the very comfortable Grand Hotel at Helsingfors, in the large Station Square, we drove to the neighbouring island of Brändö where we lunched and then explored the neighbouring ground in a completely unsuccessful search for butterflies. Finding this to be the case we drove on to another place about three miles from Helsingfors called Munksnäs, where Dr. Scott took one specimen of *Brenthis ino*, and we both came across a few *B. selene*. Walking most of the way back, it is amusing to recall the care with which we stalked a few specimens of *Pararge maera*, and the joy with which this fine dark form was hailed, since it afterwards became one of the commonest roadside insects, swarming everywhere.

The following day we took the train to Borga, a place recommended to us by the Purser on board our boat (the *Arcturus*), who had himself been a butterfly collector in former days. Here we found an old disused quarry close to the station in which we spent almost the whole time of our visit there. The sunshine was intermittent, but a good many species were taken. *Coenonympha iphis* was abundant in both sexes and very fresh; *Polyommatus amandus* was not uncommon, though it had lost its first freshness, and I had the good fortune to take a ♀ (unfortunately not in very good condition) much suffused with blue on the upper side, the only ♀ of this form that I have ever met with from any locality. Other species taken or seen were *Brenthis selene* (common in the field on the other side of the road) *Pieris rapae*,

P. napi, *Chrysophanus hippothoë*, *Rumicia phlaeas*, *Polyommatus icarus*, *Coenonympha pamphilus*, *Aphantopus hyperantus*, *Pararge maera* and *P. achine*.

The following day we left Helsingfors for the west of Finland, going by train to Tampere (Tammerfors) where we were met by a car from our destination, Ryömälä Farm, a kilometre from the village of Mouhijärvi, and about 25 miles from Tampere. The heat at Helsingfors had been so great that we had all left our warm clothing behind; but the first two days at Ryömälä were very cold, the thermometer rarely rising above 40° Fahr. The next day however it rose to 80°, and the rest of our stay in Finland was decidedly hot. We found excellent hunting ground in the immediate neighbourhood of the house, on the path bordering a wood, on the sloping track down to the lake, and especially in a field on the further side of the wood, and occasionally in the wood itself. Four species swarmed, viz., *Vacciniina optilete*, *Brenthis selene*, *Pararge maera* and *Aphantopus hyperantus*. On the narrow track leading down to the lake *Brenthis ino* was not uncommon; *Euchloë cardamines*, very worn, and *Leptosia sinapis*, not very fresh, *Coenonympha pamphilus*, *Melitaea athalia* and *Pieris napi* flew at the edge of the wood; in the flowery field, reached by a path through the wood, *Polyommatus icarus*, *Aricia medon*, and *Chrysophanus hippothoë*, were by no means scarce, while occasional specimens of *P. semiargus*, *P. amandus*, *Issoria lathonia* and other species were met with. In the wood itself a few specimens of *Erebia ligea* occurred at the end of our stay. We also collected along the Tampere road.

On the Monday morning, July 3rd, our host, Herr Laitakari, piloted us to a marsh about two miles away called Kankarijärvi. The day was not all that could be desired, but there were bright intervals and it was here that we first found *Brenthis arsilache* which appeared to be just coming out. It is to me amazing that this was ever supposed to be a form of *B. pales*, which it does not resemble on either surface. The black markings on the upperside are not only much broader, but are differently placed, while the underside hindwing, which varies remarkably little in its different localities, is thoroughly distinctive both in colour and markings, especially at the border; add to this the fact that *B. arsilache* is exclusively a marsh insect wherever it occurs, that it is usually, though not exclusively, found at much lower altitudes than *B. pales*, and that even when they occur in the same neighbourhood they fly on very different kinds of ground, and that *B. arsilache* then comes out considerably later, and one wonders what further proofs are required of difference of species.

On the following day we went, again accompanied by our host, to another marsh named Ahvenusjärvi, some 12 or more kilometres distant, the last three of which consist of a narrow path through very beautiful woods. The marsh, or rather moss, itself is of considerable extent, and contains the largest piece of flat ground (some three quarters of a mile each way at the broadest) that we came across in Finland. This was the first occasion on which we found *Colias palaeno*, mostly ♀s, but they were very difficult to catch; the moss being ankle-deep, pursuit except on the narrow path was almost impossible. *Brenthis arsilache* was very common here, and of course *B. selene*; *B. euphrosyne*, rather small and dark, but mostly very worn, occurred in small numbers, and here also we took a few worn specimens of *B.*

aphirape race *ossianus*, which was so like *B. euphrosyne* on the wing, and even when settled, that it was only by accident that the discovery was made. At the edge of the lake a few specimens of *Coenonympha typhon* were picked up by Dr. Scott, so small and ill-marked that we may have passed others over as *C. iphis*. The moss here is in a wood with scattered pine-trees, though surrounded by a thick undergrowth and trees of several kinds, only becoming wet on approaching the lake. Except the ubiquitous *P. optilete* there was not much else to be obtained, but the few species there were afforded sufficient excitement.

On the Wednesday morning I went across to the other side of the lake (on a steep cliff above which the house is built), to a wood where Dr. and Mrs. Scott had found *Plebeius aegon* in some numbers and a few *P. argus* a couple of days before, but was quite unsuccessful. This was our last day at Ryömälä, as we left about 11 p.m. for Tampere for an all-night journey across to East Finland. Our stay had been most enjoyable and we felt as if leaving old friends when parting from our host and hostess and their family. Besides the farm house itself there are several small bungalows, and the whole place is used in the summer as a boarding house.

Though our journey across Finland was a night one, it was never dark. The sun sets only about an hour later than in England, and rises rather less than an hour earlier, but is so short a distance below the horizon that it was never too dark while we were at Ryömälä to see the time by one's watch even indoors; by 4 a.m. the sun was quite hot.

Our destination, Savonlinna, was one of the most beautifully situated, indeed I think the most beautifully situated little town that I have ever seen. Built on an island and surrounded by others, mostly well wooded and hilly, the views in every direction are enchanting; they are beyond description and must be seen to be appreciated. We arrived between 11 and 12, having engaged rooms at the Hotel, but I was too tired to go out in the afternoon. Dr. and Mrs. Scott went to one of the neighbouring islands and took among other things a specimen of *Parnassius apollo*. On the following day we drove about 9 kilometres to a small lake and marsh called Sylkynjärvi. Here again we met with *C. palaeno* and *B. aphirape* race *ossianus* but in the immediate neighbourhood of the marsh the only other species that occurred, except the ubiquitous *P. optilete* and *B. selene*, were *B. euphrosyne* and *M. athalia*. On the grassy margin of the larger lake on the other side of the road *P. aegon* of both sexes was to be found, and Dr. Scott and I each took a black and white skipper; mine was certainly *Hesperia alveus*, and a close examination of his in the light of Warren's monograph has convinced me that his is also *H. alveus* but of the *serratulae-formis* aberration. *P. maera* was as common here by the roadside as elsewhere, as also was *A. hyperantus*, and in the wood Dr. Scott saw (and missed) a specimen of *Papilio machaon* and saw on a tree trunk what at sight he took to be a ♀ *Apatura iris*, but was not near enough to be absolutely certain. Since however *A. iris* does not occur in Finland we concluded that it must have been a ♀ *Limenitis populi* which does. The only skipper I saw here was *Pamphilus sylvanus* both sexes of which occurred. Dr. Scott also found *M. maturna* in the wood.

On the following day we crossed by the railway bridge to another island and hunted along the sides of the railway. People move freely along the railway lines here, and as there are only two trains each way in the day it is not a dangerous practice. *P. amanda* occurred again here but was too worn to keep, and a few worn *M. maturna* were also taken. On the railway bank, amongst other specimens, were a good many tiny specimens of *B. selene*, some not larger than *P. coridon* or a large *P. icarus* such as we found at Ryömälä. *P. aegon* occurred on the same ground. After a time Dr. and Mrs. Scott went off across the hill on a voyage of discovery, and found *P. apollo* in considerable numbers. In the afternoon they went a long expedition by boat to Punkaharju where they found *Pararge hiera* but too worn to be worth taking. Meanwhile I went across to one of the further islands, but only brought back four specimens, all however well worth the walk: they consisted of a ♀ *P. apollo*, a good ♀ *M. maturna* (all the others were worn) a specimen of *Argynnis niobe* ♂ and a light clay-coloured ♀ of *B. selene*, very fresh. On our last day I was unfortunately unable to leave my room, but Dr. and Mrs. Scott went to try and find specimens of *P. apollo* for me where they had taken them the previous day, but none were forthcoming.

(To be concluded.)

Additional Records of Ants and Myrmecophiles in Britain since the 2nd edition of "British Ants" (1927) and my Paper on the Ants and Myrmecophiles of Windsor Forest (1930).

By HORACE DONISTHORPE, F.Z.S., F.R.E.S., etc.

(1) Additional Records:—

PONERINAE.

PONERA COARCTATA, Latr.

Devon, S.: Slapton Lea (*Donisthorpe*).

Glamorgan: Llandaff (*Hallett*).

MYRMICINAE.

MONOMORIUM PHARAONIS, L.

Kent, E.: Maidstone (*Frisby*).

MYRMICA LAEVINODIS, Nyl.

Berks: Windsor Forest (*Donisthorpe*).

Main Argyle: Bencruchan (*Waterston*).

MYRMICA LAEVINODIS, Nyl., var. *RUGINODO-LAEVINODIS*, Forel.

Shetland (*Squire*).

MYRMICA RUGINODIS, Nyl.

Monmouth: Trelleck (*Hallett*).

MYRMICA SCABRINODIS, Nyl.

Kincardineshire: Auchenblae Fordown (*Waterston*).

MYRMICA SCABRINODIS, Nyl. var. *SABULETI*, Mein.

Sussex, E.: Bexhill (*C. O. Waterhouse*), in Brit. Coll. B.M.

Berks: Windsor Forest (*Donisthorpe*).

MYRMICA LOBICORNIS, Nyl.

Westmoreland: Windermere, and Langdale (*Blair*).

Berks: Windsor Forest (*Donisthorpe*).

MYRMICA SCHENCKI, Emery.

Wicklow : South Strand, and Arklow (Stelfox).

Carlow : R. Slaney, Kilcarrig Bridge (Stelfox).

LEPTOTHORAX ACERVORUM, F.Norfolk, W. : Lynn (*S. O. Taylor*).Monmouth : Trelleck (*Hallett*).Notts : Thoresby Park (*S. O. Taylor*).

Westmoreland : Ulleswater, and Foulshay (Blair).

Main Argyle : Ben Cruchan (Waterston).

LEPTOTHORAX TUBERUM, F. Devon, S. : Branscombe, nesting in stem of burdock (*Blair*).**TETRAMORIUM CAESPITUM**, L.Devon, S. : Hallsands (*Donisthorpe*).

Wexford : Ballyteige Burrows (Stelfox).

FORMICINAE.

ACANTHOMYOPS (DONISTHORPEA) NIGER, L., var. **ALIENO-NIGER**, Forel.Berks : Windsor Forest (*Donisthorpe*).**ACANTHOMYOPS (DONISTHORPEA) ALIENUS**, Först.Berks : Windsor Forest (*Donisthorpe*).Down : Greencastle (*Johnson*).**ACANTHOMYOPS (DONISTHORPEA) BRUNNEUS**, Latr.Oxford : Oxford (*Richards*).**ACANTHOMYOPS (CHTHONOLASIUS) FLAVUS**, F.Westmorland : Haveley (*Blair*) ; Langdale Pikes (*Miss Longfield*).**ACANTHOMYOPS (CHTHONOLASIUS) UMBRATUS**, Nyl.Surrey : Putney (*Donisthorpe*).Berks : Windsor Forest (*Donisthorpe*).Cornwall S : St. Ives and Carbis Bay (*Thornley*).**ACANTHOMYOPS (CHTHONOLASIUS) UMBRATUS**, Nyl., var. **MIXTO-UMBRATUS**, Forel.

Isle of Wight : Blackgang Chine, in Brit. Coll. B.M.

ACANTHOMYOPS (CHTHONOLASIUS) MIXTUS, Nyl.Berks : Windsor Forest (*Donisthorpe*).**FORMICA RUFA**, L.Gloucester, E. : Overly Woods near Cirencester, and Sapperton (*Wormersley*).**FORMICA RUFA**, L., var. **RUFO-PRATENSIS**, Forel.Monmouth : Trelleck (*Hallett*).**FORMICA SANGUINEA**, Latr.Monmouth : Trelleck (*Hallett*).**FORMICA FUSCA**, L., var., **GLEBARIA**, Nyl.Essex S. : Benfleet (*Donisthorpe*).**FORMICA FUSCA**, L. var. **RUBESCENS**, Forel.Middlesex : Hampstead (*Farren-White Coll. in B.M.*)

INTRODUCED SPECIES :—

PONERINAE.

NEOPONERA THERESIAE, Forel.

Aberdeen in banana store.

MYRMICINAE.

PHEIDOLE MEGACEPHALA, F. Botanic Gardens, Cambridge.

PHEIDOLE ANASTASII, Emery. var. CELLARUM, Forel.

Cookbridge in Orchid farm (*Donisthorpe*); Botanic Gardens, Dublin (*Bullock*).

SOLENOPSIS GEMINATA, F.

Kew Gardens in numbers. Its first record for Britain. Habitat: S. America. One of the 11 species given by Forel as having become cosmopolitan.

TRIGLYPHOTHRIX LANUGINOSA, Mayr. York in numbers in Illepic nuts (*Britten*).

DOLICHODERINAE.

IRIDOMYRMEX HUMILIS, Mayr.

Windsor, in hot houses, abundant (*Donisthorpe*); Cheltenham (*Taylor*); Exeter in house (*Rowley*).

FORMICINAE.

PARATRECHINA (NYLANDERIA) VIVIDULA, Nyl.

Greenhouses at the Duffryn, Glamorgan (*Hallett*).

PARATRECHINA (PARATRECHINA) LONGICORNIS, Latr.

Tropical Gardens, Reading (*Hodson*).

CAMPONOTUS (CAMPONOTUS) HERCULEANUS, L. subsp. PENNSYLVANICUS, Retz.

The specimens recorded under this name in *British Ants*, p. 402, from Alfreton, Derbyshire = C. (C.) LAEVIGATUS, Smith.

CAMPONOTUS (TANAEMYRMEX) BRITTENI, Donis.

Liverpool, on one of Messrs. Bibbey Bros. Steamers, causing damage to the wood casing of the refrigerator chamber (*Britten*).

CAMPONOTUS (TANAEMYRMEX) AETHIOPS, Latr.

London, in hollow rhizome of orchid (*C. O. Waterhouse*) B. M. Coll.

CAMPONOTUS (MYRMOTHRIX) BUGNIONI, Forel.

Wye, Kent in Jamaican bananas (*Theobald*). The two specimens taken by Miss Tassart on apples Clapham Common and recorded in in *British Ants*, p. 404 as C. (M.) ABDOMINALIS, F., are really C. (M.) bugnioni.

CAMPONOTUS (MYRMOTHRIX) ABDOMINALIS, F.

Borough of Luton, in oranges. Eltham, Kent in bananas (*Channer*).

CAMPONOTUS (MYRMOTHRIX) ABDOMINALIS, F., var. COSTARICENSIS, Forel.

Cambridge in bananas.

CAMPONOTUS (MYRMOTHRIX) ABDOMINALIS, F. var. ATRICEPS, Smith.

Streatham in bananas (*Philpott*).

CAMPONOTUS (MYRMOTHRIX) ABDOMINALIS, F. subsp. STERCORARIUS, Forel.

London in West Indian bananas (*Miss F. Ede*): Oldham, Lancs. in bananas (*Stubbs*).

CAMPONOTUS (MYRMOSPINCTA) SEXGUTTATUS, F.

London in bananas (*Scott-Elliot*): Romsey in bananas.

CAMPONOTUS (MYRMOTREMA) GRANDIDIERI, Forel subsp. RUSPOLII, Forel var. ROLLEI, Forel.

Stonehouse, Gloucester (*Farren-White*). In "Ants and their Ways" p. 53 (1884), Farren-White writes that he discovered some years back several representatives of a new species of ant in his own Vicarage.

He also mentioned that he found specimens in Smith's collection labelled "Stonehouse Vicarage" which he had given to the latter. I have found these specimens and have identified them as above. Now in introduced coll. B.M.

(2) New Windsor Forest Records:—

MYRMICINAE.

MYRMICA RUGINODIS, Nyl.

A large colony nesting in moss; the beetle *Othius myrmecophilus*, Kies., was also present in some numbers, 31.viii.32.

Marriage flights of several colonies in various parts of the Forest, 18.vii.33.

MYRMICA LAEVINODIS, Nyl.

A colony under stone; a number of deälated ♀ ♀ present, 26.iv.33. The first record for Windsor of this species.

MYRMICA SULCINODIS, Nyl.

A ♀ was taken on the wing 24.vii.31.

MYRMICA SCABRINODIS, Nyl.

A deälated ♀ found in a moor-hen's nest, 22.vi.31; a winged ♀ swept up, 22.x.31; marriage flights occurred 18.vii.33.

STENAMMA WESTWOODI, West.

A number of ♂ ♂ were found in "Cossus" frass in a hole in an oak tree, 16.vi.31; a ♂ was swept off grass 30.v.33.

LEPTOTHORAX ACERVORUM, F.

A ♂ was taken on the wing, 24.vii.31.

LEPTOTHORAX NYLANDERI, Först.

A colony was taken nesting under bark at the foot of an oak 13.vii.33. This was taken home and fixed up in an observation nest. No ants have died, and several ♂ ♂ are now present. A small colony was found nesting in a dead branch beaten off a lime tree, 24.viii.32.

FORMICIDAE.

ACANTHOMYOPS (DENDROLASIUS) FULIGINOSUS, Latr.

A ♀ was found with three wings, which she got rid of when put in a box, 18.viii.31. She was almost certainly fertilized, and was looking for a nest of *umbratus* to found her colony in.

ACANTHOMYOPS (DONISTHORPEA) NIGER, L.

A specimen of *Pezomachus instabilis*, Först. was taken running in company with *niger* ♂ ♂; superficially very like the ants.

A ♂ of the spider *Theridion bimaculatum*, L., was running over a *niger* nest 3.vii.32; it waved the legs about in a very ant like manner. Marriage flights occurred 18.vii.33.

ACANTHOMYOPS (DONISTHORPEA) NIGER, L. var. ALIENO-NIGER, Forel.

A number of ♂ ♂ were beaten off aspens, 15.viii.33. They were, no doubt, attending plant-lice. This is the first record of this variety for Windsor.

ACANTHOMYOPS (DONISTHORPEA) BRUNNEUS, Latr.

The Proctotrupids, *Callicerus myrmicarum*, K., 2 ♀ ♀, and *Conostigmus antennalis*, K., 1 ♂, were taken in a *brunneus* nest in an oak stump 27.vi.33. The *Conostigmus* is new to Britain. I am indebted to Mons. Ferrière for the names of these insects.

ACANTHOMYOPS (CHTHONOLASIUS) FLAVUS, F.

Marriage flights occurred on 18.vii.33.

ACANTHOMYOPS (CHTHONOLASIUS) UMBRATUS, Nyl.

The mite *Urodiscella ricasoliana*, Berl., 1 ♂ and several hypopi were found on the body of an *umbratus* ♀ in a nest of this ant in the base of a large dead oak, 24.viii.28.

Several deilated ♀ ♀ were taken running on the ground with dead, and half dead *niger* ♀ ♀ in their jaws. This was after a marriage flight, and having got rid of their wings they had captured the *niger* ♀ ♀ preparatory to founding colonies in *niger* nests.

FORMICA RUFA, L.

A ♂ was taken by beating hawthorn blossoms, 19.v.33.

Coccinella distincta, was abundant on and near several *rufa* nests, 18.vii.33. This is a new record for Windsor Forest, and also for Berks.

Several specimens of *Ashmedopria sociata*, Kief. were taken in a *rufa* nest 15.ix.33.

FORMICA FUSCA, L.

A ♂ of the mite *Laelaps (Hypoaspis) myrmecophilus*, Berl., was taken in a *fusca* nest under a board 24.viii.33.

A specimen of the beetle *Atemeles emarginatus*, F., was taken in a small *fusca* nest at the roots of a stump, 17.vii.31.

A slowworm was seen in a *fusca* nest at the roots of a tree, 5.viii.31.

A winged ♀ was swept up, 10.x.31; a very late date.

A larva of *Atemeles emarginatus*, F., half grown, was found amongst the brood in a *fusca* nest under a sod containing a deilated ♀, many ♀ ♀, eggs and young larvae, 16.viii.32.

FORMICA SANGUINEA, Latr.

A ♀ was taken on the wing, 24.vii.31.

Many *Sanguinea* ♀ ♀ very active from different colonies were running with cocoons in their jaws, 18.vii.33; slave raids must have taken place.

The Early Stages of Indian Lepidoptera.

By D. G. SEVASTOPULO, F.R.E.S.

INTRODUCTION.—The more easily obtained books on Indian Lepidoptera are, I have found, of very little help in the identification of the early stages; a large number of the few descriptions appearing in Sir George Hampson's *Moths in the Fauna of British India* and in the Indo-Australian section of Seitz's *Macrolepidoptera of the World* are vague, incomplete and even inaccurate, whilst Evans, in his *Identification of Indian Butterflies*, ignores the early stages altogether.

I have, therefore, made a point of recording brief descriptions of the various larvae that have passed through my hands, in the hope that they may prove of use to other Entomologists working in India.

When numbering the somites I have in all cases ignored the head, the 1st somite is, therefore, the one immediately behind the head, i.e., the first thoracic somite. Further, in spite of the fact that most of the descriptions are noted as being made from a single larva, they have all been checked with other examples, so that there is no danger of an

aberration masquerading as the usual form. There is, however, always the possibility of some of these descriptions applying to local forms only.

In cases where the description given in the four volumes of *Moths* by Sir George Hampson in the *Fauna of British India*, or in the English Edition of the Indo-Australian section of Seitz's *Macrolepidoptera of the World*, is particularly incomplete, or misleading, I have added it to mine with the reference "Hampson" or "Seitz" as the case may be.

PAPILIONIDAE.

Moore, *Lep. Ind.*, V. 178, pl. 442, figs. 1, 1a-1c (1901-3).

Byasa aristolochiae, F., *aristolochiae*.

Head and legs black. Body velvety black, the 6th somite with a white transverse band. The skin between the somites dark purplish crimson. 1st to 3rd somites each bearing eight coral red fleshy tubercles, the dorsal four on the 1st somite being very much smaller than the others. 4th to 10th somites each bearing six of these tubercles, those on the 6th being white, except the lowest one which is red. 11th and 12th somites with four tubercles. Osmeterium yellow.

Pupa fawn, very like a curled dead leaf. Thorax keeled with five white lines anteriorly and two posteriorly diverging from the keel. Wing cases darker brown and developing into a lobe anteriorly. The first three abdominal somites each with a white lateral U-shaped line. 4th to 7th abdominal somites each bearing a pair of conspicuous rounded lobes. Suspended by a girdle and a tail pad of dark brown silk.

Foodplant.—*Aristolochia* sp.

Described from a full fed larva found in Calcutta 8.x.31, pupated 12.x.31 and a female emerged 26.x.31.

Seitz does not mention the number of tubercles nor the inter-segmental colour and omits the colour of the pupa.

Chilasa clytia, L., *clytia*.

Moore, *Lep. Ind.*, VI. 80, pl. 506, figs. 1, 1a-1d (1903).

Head and legs black. Ground colour black. A wide cream dorsal stripe from the 1st to the 9th somite, a cream lateral stripe from the 1st somite joining the dorsal stripe on the 7th and forming a trident, and a cream lateral stripe extending backwards from the 10th somite. A subdorsal series of fleshy black tubercles with a rose pink spot at the base of each. A double lateral series of rose pink spots, the upper complete and the lower with spots on the 3rd, 4th, 5th, 7th, 8th and 9th somites only. The osmeterium blue.

Pupa like a broken piece of stick, mottled with various shades of brown. Cylindrical, the last four abdominal somites hollowed out below. Thorax not keeled, but projecting forward over the head, which is truncate. Supported by a girdle and tail pad of dark brown silk.

There is no difference between the type and *v. dissimilis* in the early stages.

Described from a full fed larva found in Calcutta 20.iv.31, pupated 23.iv.31 and a female emerged 4.v.31.

Seitz does not mention the cream coloured markings and states that the "fork on the neck" (osmeterium?) is pale coloured.

PIERIDAE.

Huphina nerissa, Fab., ssp. *evaete*, Cr.

Moore, *Lep. Ceyl.*, I. 136, pl. 53, figs. 1, 1a, 1b (1881): Bell, Jr. Bomb. N.H.S., x. 574 (1897).

Typical Pierid larva of a dark velvety green. Very like that of *Pieris rapae*.

Pupa very like that of a *Pieris rapae* in shape. Two colour forms: one green, with head, thoracic keel and a triangular patch on each side of the meta-thorax pale brown, the other with ground colour darker and the same markings in paler brown.

Foodplant.—*Capparis* sp.

Described from a full fed larva found in Calcutta 22.xi.30, pupated 24.xi.30 and a male emerged 5.xii.30.

(To be continued.)

SCIENTIFIC NOTES AND OBSERVATIONS.

MOVEMENT OF BUTTERFLIES, POSSIBLY MIGRATORY.—Ballard Down, Dorset is about 400 ft. above sea level and is nearly waterless.

North of the Down is wide expanse of nearly treeless heath of Eocene and post-Eocene deposits, entirely devoid of calcium.

On July 22nd, 1933, Capt. Cecil Diver, F.L.S., F.R.G.S., told me, that that morning fairly early he had observed a movement from the Down to, and across the heath, of *Pieridae*, the three common whites, a few *Colias* and with them a number of *Polyommatus (Agriades) coridon*, Poda. I arrived on the heath about three in the afternoon not knowing of Captain Diver's observation; there were then not more than the normal number of "Whites" about, but there were a number of *Pyrameis cardui*, L. present and to my surprise *A. coridon*. The wind had been South veering with the Sun to South West by West as the day progressed. The morning movement had been nearly due North but the *A. coridon* I saw of both sexes were then travelling against the wind back to the Chalk Down unaccompanied by any Pierids.

About 10 p.m. G.M.T. a single *Iodis vernaria* came to my lamps, which were out on the heath at least one mile from the nearest Clematis.

There are several possible explanations: the movement may have been a true migration and the Pierids having travelled some 4 miles to the edge of Poole Harbour continued across the water to the mainland. This I have seen the larger butterflies do on several occasions. I have seen more than one *Pyrameis atalanta*, L., half way across the Harbour say $2\frac{1}{2}$ to 3 miles from shore. The smaller Lycaenids may have been turned by the water and reversed their direction.

The Lycaenids may have come down to the swampy places to drink and been going back to the Hills to roost and their presence amongst the Pierids in the morning a mere coincidence. I hardly think this is the true explanation, and I have never seen any Lycaenids engaged in drinking on the heath swamps. On the other hand, Mr. S. C. Scarsdale Brown tells me that he has seen *A. coridon* out on this heath before on more than one occasion, and both he and I have taken *Aricia medon (astrarche)*, Bgst. out there repeatedly, and this species is no more an inhabitant of the Dorset Heaths than *A. coridon* is.

It will be noted that the Geometer is not a heath species and it had travelled from the Chalk Down habitat to the totally unsuitable heath on the same path as the Lycaenids had taken.

I came around the Harbour in a car to Studland and in the Wareham district at about 2.30 p.m. there were a number of the common "Whites," which were more than the normal population. Wareham would be about ten miles due North of the place of Capt. Diver's observation. Coming from Bournemouth my road did not take to the Harbour shore at the most likely point for a Purbeck migration to land, and I did not notice many Pierids till within a mile of Wareham, nor were they noticeably numerous between Wareham and Studland. If this note be read and the places looked out on the geological survey map the suitability and otherwise of the habitats will be abundantly evident.—W. PARKINSON CURTIS, (F.R.E.S.), 14, Alington Road, Bournemouth.

STRANGE FEEDING HABIT OF A DIPTERON (*DESMOMETOPA M-ATRUM*, Mg.).—On the morning of August 31st on the day following my arrival at Jaca, Spain, I noticed a ♀ green Mantid of a species rather smaller than *Mantis religiosa*, eating a worker honey bee which it had evidently caught as it was visiting a flower near by. I watched the Mantid feed on the thorax of the bee, making a ragged hole in the side with its jaws; and then to my surprise I saw a small fly settled on the under-side of the Mantid's jaws, and another on the bee's still struggling body. I repeatedly saw both these flies draw near to the edge of the wound in the bee's thorax and apparently feed on the flesh of the insect while the Mantid was busy masticating its previous bite. A third fly appeared from somewhere and joined in the game while the Mantid seemed to take no notice of them whatever, even when they crawled over its legs and body. The observation was made at the end of my first morning's hunt in a rich locality and I had only one rather small box left, so decided to attempt to box the bee from the Mantid's claws together with the flies, if possible. My attempt resulted in the capture of only one fly with the bee, which by now had ceased to struggle. The other two however, did not fly away, but settled one on the box and the other on my hand. I opened the lid very slightly—watching to see that my one captured fly did not escape—and one after the other they crept into the box to resume their interrupted meal. As they could no longer see the mangled corpse of the bee, they must have been led by some other sense to enter the box. I am sending on the three flies for identification and will keep a lookout for similar phenomena, which may be quite common, though this is the first time I have observed anything of the kind.—WM. FASSNIDGE (M.A., F.R.E.S.) 47, Tennyson Rd., Southampton.

[The flies have been kindly determined by Mr. J. E. Collin as *Desmometopa m-atrum*, Mg. (fam. *Agromyzidae*). Mr. Collin gives a reference to a note by Mik (*Wien. Ent. Zeitschr.* XVII., 1898, p. 146) describing how he found a number of the flies on a fresh killed worker in a spider's web, and states that he has himself found the flies on dead bees. The presence of the Mantis in Mr. Fassnidge's account would therefore appear to be quite fortuitous, merely providing the freshly killed bee.—K. G. BLAIR.]

UNUSUAL BEHAVIOUR OF LARVAE OF *TORTRIX VIRIDANA*, L.—When in Windsor Forest on May 6th last we noticed long cords of web reaching from the very tops of some high oak trees to the ground. We broke off one of these cords as high up as possible with a long beating stick, as a number of larvae were attached to each cord.

Some of these larvae were taken to the British Museum where they bred out and proved to be *Tortrix viridana*, L.

I understand that a single larva descends to the ground on a thread of web to pupate: but in this case there must have been hundreds of larvae on each cord, and I am told this has not been observed before.

It has been suggested that a number of threads might have been joined together by the wind, but it certainly did not look like that, and the cords descended singly from different parts of the trees.—HORACE DONISTHORPE, (F.Z.S., F.R.E.S.), British Museum (Natural History), 12.vii.38.

[Similar behaviour was noted at Ashted this May.—T.B.-F. and H.J.T.]

Short Notes on the Season.

In an Evesham local paper we read of *Manduca atropos* pupae and larvae being found at Ashton-under-Hill, Offenham, Alderton and Bishops Cleeve. There is a very creditable portrait of a moth in the above paper.

With regard to the old haunt of *Lycaena arion* in the Cotswolds we quote from a correspondent's letter "There are some disgusting instances of over collecting by comparatively well-known people."

Mr. Routledge of Headsnook, Carlisle, writes, "The collecting here has not been very good. Very few Noctuae at sugar. I generally have a good time in September and October."

Mr. H. Haynes of Salisbury writes, "I and my son-in-law have devoted most of our spare time to the 'Blues.' *Polyommatus icarus (alexis)* has been abundant in both broods. We took a very fine series, the best being a very fine *obsoleta* form as depicted in South's 'Butterflies' plt. 119, figure 5. It is a very good specimen, the best we have ever taken. We all had a nice range of *Polyommatus thetis (adonis)* including some good variations; this insect was in greater numbers than it had been for some years. *P. coridon* was plentiful but variation not so good as usual although we had a few good ones. The flight was soon over, practically by mid-August. This I attribute to the extreme heat which brought all the insects out at once. In past years we have taken good varieties in mid-September. On the whole we had a good season. It was the first time that we had paid strict attention to the 'Blues' other than *P. coridon* and we were well repaid."

Capt. C. Q. Parsons of Torquay writes "A full fed larva of *Deilephila galii* was given me by a caddie on August 12th last, found on Brancaster golf course, Norfolk coast, where the *Galium* grows as it does at Deal. It pupated 2 days later."

Mr. P. Brodie of Sutton, Surrey reports a newly emerged *Manduca atropos* at Brancaster near King's Lynn on Sept. 26th from a pupa dug up from a small potato patch. Also that on Oct. 10th near

Haslemere, a fresh dark form of *Polygonia c-album* was noted by him sitting on a michaelmas-daisy.

Mr. G. S. Robertson (M.D.), Storrington, records the following Lepidoptera at light.—It may be of interest to record my captures last night at the electric light in my bungalow, as it was, to me at least, a very exceptional experience. There were threats of a thunder-storm in the sky, a warm S.W. wind, but very little, dry and a new moon. Between 11 p.m. and 1 a.m. summer-time the following species were taken:—*Cosmotriche potatoria*, common, *Leucoma chrysorrhoea* (similis), *Pterostoma palpina*, *Lophopteryx camolina*, *Mitochrista miniata*, *Lithosia griseola*, common, *Plusia gamma*, *Plastenis retusa*, *Leucania pallens*, *L. conigera*, including very pale forms, *Gonoptera libatrix*, *Ennomos alniaria* (tiliaria), *Selenia bilunaria* the summer form *ilunaria* (juliaria), *Hipparchus papilionaria*, *Ptychopoda aversata*, *Triphosa dubitata*, *Perizoma alchemillata*, *Eupithecia centaureata* (oblonga), *Chloroclystis coronata*, *Abraxas grossulariata*, *Arentia flexula* 2, *Pyralis costalis*, *Endotricha flammealis*, *Pionea forficulis*, *Spilodes verticalis*, *Crambus culmellus*, *C. tristellus*, *C. latistrius*, *Aphomia sociella*, *Hypena proboscidalis*, *Rivula sericealis*, several, *Orneodes hexadactyla* (polydactyla), and *Alucita pentadactyla*.—25.vii.33.

CURRENT NOTES AND SHORT NOTICES.

Two meetings of the Entomological Club were held at Oxford on Saturday, July 1st and Sunday, July 2nd, 1933. On the former date Prof. E. B. Poulton was in the Chair and on the latter Dr. Eltringham presided. *Members present*:—Mr. Robt. Adkin, Mr. Horace Donisthorpe, Prof. E. B. Poulton, F.R.S., Dr. Harry Eltringham, F.R.S., Mr. W. J. Kaye. *Visitors present*:—Mr. H. E. Andrewes, Dr. Malcolm Burr, D.Sc., Mr. E. Bolton-King, Prof. G. D. Hale Carpenter, Dr. F. A. Dixey, D.M., F.R.S., Mr. E. B. Ford, Dr. Karl Jordan, F.R.S., Sir Guy Marshall, Capt. N. D. Riley, Mr. C. J. Wainwright, Comm. J. J. Walker, Dr. C. A. Wiggins. On Saturday the party met at the Hope Department, Oxford University Museum, and were joined by many friends to tea. Dinner was served in the evening at Jesus College, where six of the party stayed for Saturday and five for Sunday night. On Sunday the party started in cars from the front of the University Museum for Bagley Wood, and had tea in the Forest Room by kind permission of St. John's College. In beautiful weather the party spent a pleasant time in the wood. Many "White Admirals" were seen and a few captured. They seemed to be unusually skittish and lively, and the familiar floating flight conspicuously absent. Dinner was served in the evening in College and a very interesting evening was spent. The party dispersed on Monday morning.—H.W.-E.

We hope to be able to complete the Maurin article next month with detailed descriptions of special forms, and notes on a few particular species, and also hope to be able to issue two further plates with it.

The Annual Exhibition of the S. London Entomological and N.H.S. takes place on October 26th at their Meeting Room, Hibernia Chambers, London Bridge. It is important that all those intending to exhibit will notify me at 25, West Drive, Cheam, the amount of

space they require, before Saturday, October 21st that it may be reserved, together with *details of their exhibit* suitable for record and publication in the Annual Proceedings.

In recent months the study of Lepidoptera has had an unusual number of losses by death. J. de Joannis the great French micro-lepidopterist died at the age of 79; Püngeler of Frankfurt-a-Main, a macro-lepidopterist of world-wide knowledge; Vorbrodt who devoted himself to the Swiss fauna and was particularly interested in the Alpine distribution of the macros; Corti, than whom no one had a greater knowledge of the *Agrotidae*; and Petersen who as traveller and collector, and student of the study of the genitalia had earned a lasting reputation, have all passed away.

Vol. V. The *Carlisle Nat. Hist. Soc. Transactions* is now in the Press and will contain we are informed a History of the Society, and sections dealing with Collecting at Light; the Neuroptera of Cumberland, Westmoreland and Furness; Additions to the Lepidoptera Fauna of the district; the Ants, Bees and Wasps of Cumberland; Additions to the Coleoptera of Cumberland; with several articles on Birds and Mammals. Members of this Society may come and go, but our correspondents of long ago, Mr. G. B. Routledge and Mr. F. H. Day seem to go on for ever in their zeal for entomology and for their local Society.

The Lepidopterology in the *Verh. Zool.-Bot. Gesel. Wien. 1932* consists of a Lepidoptera Fauna of the Oetzthal by Moriz Kitt, and fifteen pages of Proceedings in which Hans Reisser recounts his holiday in Spanish Morocco; Josef Nitsche, his experiences with light, etc., in the Carnic Alps; Dr. Zerny, his summer in the Lebanon; Fritz Wagner, his fourth visit to Anatolia; and Fritz Preissecker, his recent experiences in field work in Lower Austria. Kitt also discusses the variation of *Angerona prunaria* with 6 figures, showing the form *alpina*.

The full account of Dr. Zerny's experiences in the Lebanon are printed in the current part of *Iris*. There is a plate of some 40 figures of new forms and species.

The *London Naturalist* for 1932 contains the following items in entomology:—The Report of the Entomological Section for the year, shows that there were 5 meetings with nine field meetings, and 4 papers were read. Among the papers printed is an interesting and useful one on the "Dragonflies of Epping Forest," by E. B. Pinniger, and "British Butterflies in 1932" by H. J. Burkill who annually collects items of interest on this topic. His remarks on *Limenitis sibilla*, *Melanargia galathea*, *Aphantopus hyperantus*, *Agriades coridon* and *Urbicula comma* are worth noting. Mr. Burkill also gives a series of notes for the year on various entomological topics, Butterflies and Birds, Larval Notes, Parasites, etc., and three pages of his annual report on Plant Gall records.

REVIEWS AND NOTICES OF BOOKS.

ANNUAL REPORT OF THE ETON COLLEGE NATURAL HISTORY SOCIETY, 1932-3.—This well produced report contains an account of the Society's activities, their indoor meetings with summaries of two lectures, visits

to the Zoological Gardens, collecting trips, and museum work. The subject with which we are immediately concerned received a considerable amount of attention by a small section in which our sometime correspondent Brig.-Gen. B. H. Cooke continues to take a real interest. For this year he has presented to the Museum a book compiled by himself on "Collecting Lepidoptera on the Continent," and has contributed to the Report an "Annotated List of the Lepidoptera from the Eton District." One of the members had a moth trap working for the months of May and June and lists no less than 83 species obtained and containing several species not hitherto recorded for the district. In a note on the Season it is recorded that on April 30th at Chiddingfold 13 species of butterflies were reported and that 3 *Odontosia carmelita* were obtained near Ascot at the end of April. The Museum was enriched by a gift of a Collection of European Butterflies contained in two cabinets and many boxes. A Collection of Indian Butterflies were also received. Of the 5 plates produced from members' photographs, that of a Tiger's head is particularly striking. The Report is a very interesting account of sterling educational work and method ably carried out.—HY.J.T.

THE SUPPLEMENT TO SEITZ PALAEOARCTIC LEPIDOPTERA.—Pts. 41 and 42 have just appeared. Part 41, Vol. II. contains two sheets of additions to the Palaearctic *Psychidae* by Dr. E. Wehrli. The views of Burrows on the inter-relationship of the *Psychidae* with other families are mentioned with a summary of his observations and those of Jones (America) and of Seiler are comprised in two folio pages of most interesting notes, a summary of much biological matter on a family, whose species are small, insignificant in appearance, generally rare and much neglected by the average entomologist. The British species dealt with are *Acanthopsyche atra*, *Pachythelia villosella*, *Sterropteryx hirsutella*, *Epichnopteryx pulla*, *Fumea casta* (the work of Burrows, Chapman and Tutt is summarized) and *F. crassiorella*. On plate 14 there are 31 figures of the forms dealt with in the section *Psychidae*.

Part 42, Vol. III., 3 sheets contains the conclusion of the notes on the genus *Agrotis*, which the much lamented Dr. Corti left, and the consideration of the additions to the genus *Rhyacia*, formerly a part of the huge genus *Agrotis*. The British species of the *Rhyacia* in this part are *Rhyacia subrosea* (3 forms), *R. glareosa* (2 forms), *R. margaritacea* (4 forms), *R. depuncta* (4 forms), *R. flammatra* (3 forms), *R. simulans* (1 form), *R. lucerneae* (8 forms), *R. ashworthii*, *R. candelarum* (3 forms), *R. saucia* (4 forms), *R. hyperborea* (4 forms), *R. dahliae* (4 forms), *R. festiva* (2 forms), *R. brunnea* (2 forms), *R. baja* (2 forms), *R. c-nigrum* (4 forms), *R. ditrapzium* (2 forms), *R. plecta* (5 forms), *R. xanthographa* (9 forms) and *R. putris* (1 form). To the student of Variation in the Noctuae this part is quite useful and necessary.

At the same time as the receipt of the above, we received pts. 199, 200 of the Main Volume of the *Fauna Indo-australica* being 3 sheets and 3 plates of Vol. X., the conclusion of which is rapidly approaching. The *Hepialidae* of the area are dealt with by the late R. Pfitzner and by M. Gaede. There are three plates of figures of many of the extraordinary species of the tropical "swifts."—HY.J.T.

The *Revista Soc. Ent. Argentina* Vol. V., No. 24 contains the third part of the comprehensive Monograph of the *Hesperiidae* of the country by our friend Capt. Hayward. In this portion the *Pyrginae* are dealt with, comprising 75 species of which 14 are new described with 3 new subspecies. There are 14 black and white plates containing over 220 figures of imagines, venation and genital armature. Not only are the species illustrated, but numerous forms of each species are pictured. The matter is systematically presented and contains the summary of Capt. Hayward's discoveries during the years he has been in the country as well as those of the Breyer brothers for many years past, and of other entomologists. Such a work as this is a stimulus to those taking up the study, gives them references for ready identification of captures, saves an immense amount of time, so that the future students can the sooner commence to advance the knowledge of the biology of these beautiful creatures. Other articles in this number treat of (1) The Parasites of the Psychid, *Oceticus kirbyi*. (2) Notes on the Biology of *Castnia archon*. (3) The Systematic Position of the Moth, *Mesolenca bruchi*. (4) The Variability of *Dysdaemonia fosteri*, and (5) The Life-history of *Automeris grammivora*. All these are well illustrated with plates, figures and diagrams.—HY.J.T.

REPORT ON INSECT PESTS OF CROPS IN ENGLAND AND WALES, 1928-31, Issued by the Ministry of Agriculture and Fisheries. (Price 1s. net. postage extra.)—This *Bulletin* No. 66, for which Mr. J. C. F. Fryer, the Director of the Plant Pathological Laboratory, is responsible has been compiled from the communications of the 14 Reporters, each of whom is responsible for one of the 14 Provinces into which England and Wales has been parcelled out for observation. There is first an account of the developments in the Methods of Control of Pests during the Period. This is succeeded by details of recent Foreign Introductions. Then comes Particular Considerations of the Specific Pests of the Different Crops under Cereal Pests, Potato Pests, Grassland Pests, etc.; Fruit Pests, are considered at length. The Report concludes with a List of References to Papers published during the period on the subjects of the Report. A capital Index is appended. A concise and useful report.—HY.J.T.

A Note.

The first volume of the *Supplement* to Tutt's *British Noctuae and their Varieties* will be concluded next year. The later volumes of Tutt's work were more complete than the first, and hence the additions will take less space. The following species will complete the volume. *Chareas graminis*, *Aporophyla australis*, *Luperina luteago*, *L. dumerilii*, *L. cespitis*, *L. testacea*, *L. guenei*, *Grammesia trigrammica*, *Hydrilla palustris*, *Acosmetia caliginosa*, *L. exigua*, *Caradrina morpheus*, *C. alsines*, *C. ambigua*, *C. superstes*, *C. taraxici*, and *C. quadripanctata*.

If those interested in the Noctuae would go through their series and see the range of variation shown, locate this if possible, and if possible point out the extremes with any more or less definite intermediate form, and describe comparatively any striking aberration in marking from the usual registered and typical pattern it would be of great service to me. No one can work satisfactorily without help, and consultation with others. The "others" at present are so extremely few that it suggests one is labouring in vain.—HY.J.T.

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EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr. H. J. TURNER, "Latemar," West Drive, Cheam.

Duplicates.—*S. Andrenaeformis*, Bred 1928, well set on black pins, with data.

Desiderata.—Very numerous British Macro Lepidoptera.—J. W. Woolhouse, Hill House, Frances Street, Chesham, Bucks.

Desiderata.—Species of Dolerine and Nematine sawflies not in my collection; list sent.—R. C. L. Perkins, 4, Thurlstone Road, Newton Abbot.

Duplicates.—*Albimacula**, *sparganii**.

Desiderata.—Ova of *D. oo. pupae* of *X. gilvago*, *D. caesia*. A. J. Wightman, "Aurago," Bromfields, Pulborough, Sussex.

EXCHANGES.—Living Eggs of *Catocala fraxini* and *sponsa*, exchange for butterflies of British Isles.—C. Zacher, Erfurt, Weimar, Street 13, Germany.

Duplicates.—*Pyralina**, *Salicis*, *Ianthina**, *Orbicularia**, *Repandata* in variety, *Doubledayaria*, *Black rhomboidaria**, *Black virgularia** and others.

Desiderata.—*Hyale*, *Welsh aurinia*, *Polychloros*, *Tiphon Agathina*, *Lunigera*, *Lucerneae*, *Neglecta*, *Diffinis*, *Populeti*, *Gothica v. gothicina*, *White Leporina*, *Tridens Putrescens*, *Littoralis*, *Typhae v. fraterna*, *Rurea v. Combusta*, *Gilvago*, *Fulvago v. flavescens*, *Liturata v. nigrofulvata*. Harold B. Williams, Woodcote, 36, Manorgate Road, Kingston Surrey.

Duplicates.—A large number of species of European and Palaearctic Rhopalocera and Heterocera.

Desiderata.—All British species especially those illustrating characteristics of an island fauna. Dr. Lor. Kolb, München 54, Dachauer-str. 409, Germany, and Franz Daniel, München, Bayer-str. 77, Germany.

Desiderata.—Living larvae or pupae of *Lasiocampa quercus*. Also set specimens of same species taken before 1910 in Devon or Cornwall.

Duplicates.—*Pavonia*, set specimens or living stock: *Monacha*, ova: *ochroleuca*, *griseola*, *advenaria*, *juniperata*, *thetis*, etc.—J. A. Downes, 5, Trinity Road, Wimbledon.

URGENT.—Wanted English (Cumberland) *Erebia epiphron*. Adequate exchange will be made in European Lepidoptera.—B. C. S. Warren, 14, Avenue de l'Eglise Anglaise, Lausanne, Switzerland.

I am seeking an opportunity of exchanging Macro- and Micro-Lepidoptera with English collectors and beg to send list of duplicates.—J. Soffner, Trautenau (Bezirksbehörde), Bohemia, Tschechoslowakische Republik.

CHANGE OF ADDRESS.—T. Bainbrigge Fletcher, R.N., F.L.S., F.Z.S., F.R.E.S., to "Rodborough Fort," Stroud, Glos.

S. G. Castle-Russell, to "The Homestead," Crawley, Winchester, Hants.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. October 18th, November 1st, 15th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. Oct. 26th Exhibition, Nov. 9th.—Hon. Secretary, S. N. A. Jacobs, "Ditchling," Hayes Lane, Bromley, Kent.

The London Natural History Society.—Meetings first four Tuesdays in the month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through Members, or from the Hon. Sec. A. B. Hornblower, 91, Queen's Road, Buckhurst Hill, Essex.

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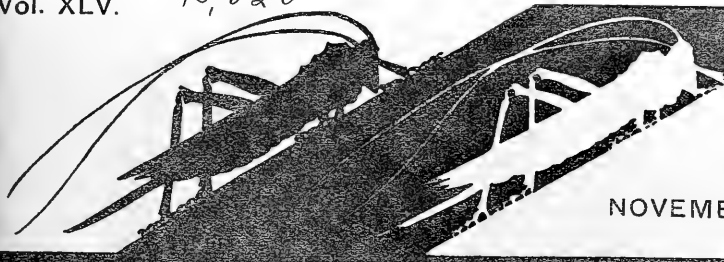
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A Butterfly Hunt in South Finland. (With 2 plates.)

By Rev. G. WHEELER, M.A., F.R.E.S.

(Concluded from page 132.)

Early the following morning we started on our return journey to Helsingfors. It took us over twelve hours and the thermometer in the railway carriage rarely registered less than 92° Farh.; moreover only a little sloping piece at the top of the windows would open! Apart from this the trains are extraordinarily comfortable, but even the "expresses" are incredibly slow; a bicycle (not a motor-cycle) can normally almost keep up with them, as I have several times seen when the road ran parallel with the railway.

We arrived at Helsingfors in the evening, returning to the Grand Hotel, but did not go beyond the town the following morning, and in the afternoon after packing went on board the *Arcturus* for our return journey. The Wednesday was spent at Hango where the boat remained for 24 hours, but the weather was so bad that I did not land. Dr. and Mrs. Scott however did so, and during a short spell of sunshine found *Hipparchia semele*, *Plebeius argus* and *P. aegon* in numbers, as well as a second specimen of *Heodes virgaureae* ♂, the first having been taken at Ryömälä just at the end of our visit there.

Two warnings occur to me. Firstly it is quite useless to look in S. Finland for really arctic species, and secondly it is well to divide one's luggage among fairly light packages. There are no porters at the Finnish stations except Helsingfors and Viborg, even at Tammerfors there were none, and one has to manoeuvre one's own luggage. Honesty is practically universal and it is quite safe to leave some packages on the platform while one puts others in the train.

The following list comprises all the species we came across and includes (at his request) Dr. Scott's captures as well as my own. In fact he was more successful than I was, partly because there were two nets to my one, and partly because he and Mrs. Scott were able to take one or two expeditions on which I was unable to accompany them.

Carterocephalus silvius.—1 ♀ in one of the woods at Mouhijärvi.

Hesperia alveus.—Two ♂s at Sylkynjärvi, very fresh.

Angiades sylvanus.—A few at Mouhijärvi, Sylkynjärvi and Savonlinna.

Adopaea flava.—One only, not good enough to keep.

Chrysophanus hippothoe.—♂s rather worn, ♀s fresh, at Borga and Ryömälä. One ♂ has an antemarginal row of 5 black spots, up.s.h.w.; the ♀s vary greatly from the completely brown form (var. *eurybia* ab. *nigra*) to bright copper ground with black spots.

Heodes virgaureae.—2 ♂s only, one at Ryömälä, the other at Hango, very fresh; they are small and seem to approach the northern race *oranula*.

Rumicia phlaeas.—Only at Borga, vii.27, worn; very pale but bright.

Nomiades semiargus.—At Borga and Ryömälä, ♂s rather small and dull, ♀s unusually large.

Polyommatus icarus.—Not common except at Ryömälä; generally large, ♀s much varied, some being quite brown, others with bright

blue on fore- and hindwing, in one specimen reaching as far as the orange-spotted border.

P. amandus.—At Borga, common; a few, worn, at Ryömälä and Savonlinna; 1 ♀ strongly suffused with blue.

Aricia medon.—At Mouhijärvi, both at Ryömälä and along the Tampere road; very large, the largest ♀ being 32mm., the ♂s quite without orange up.s., the ♀s with very small orange dots; one ♂ is striated, and one ♀ has nearly all the spots un.s.h.w. missing.

Vacciniina optilete.—By far the commonest *Lycaenid* if not the commonest butterfly met with, in fields and marshes, woods and roadsides; they are larger than the alpine specimens, and about the same size as those from Hinterzarten in the Black Forest. Some of the ♀s have a suspicion of orange up.s.h.w.

Plebeius argus.—Taken in several places and common at Hango; flying with *P. aegon*. They are generally slightly larger than alpine specimens, and Dr. Scott has one very large ♂ measuring 32mm. Both ♂s and ♀s have a border of black spots, sometimes large, up.s.h.w., followed in the ♀ by dull orange lunules, not very distinct. The ♂s have a narrow black border, the ♀s a slight blue suffusion, indistinct as a rule, but one has bright blue on the disc of the f.w., and to the border of h.w.up.s.

P. aegon.—At Mouhijärvi, Savonlinna, Sylkynjärvi and Hango; common at the latter place; small but larger than the alpine race, and even than the small race from Ploubarnel in Brittany. The ♂s have a fairly broad black border, the orange spots of the ♀ are very small. The fact that the two species fly together points to the probability that Linnaeus regarded both as one species, which from other considerations seems almost certain.

Papilio machaon.—One seen at Sylkynjärvi.

Parnassius apollo.—Only taken at Savonlinna, but there not scarce. It is a very large race, the largest ♀ measuring 104mm., but even the smallest ♂s look very large beside most other races; the ground colour is very white, and both red and black markings pronounced.

Aporia crataegi.—Only seen from the train, but generally common in S. Finland.

Pieris brassicae.—Not uncommon.

P. rapae.—Very few and those in bad condition; probably we were between broods.

P. napi. Not uncommon, but few were fresh. This race approaches sub-sp. *britannica* from Scotland and Ireland but is not nearly so fine. It is not very far removed from the specimens I took at Rognan in Lapland five years ago, but larger, the latter being small.

Euchlœ cardamines.—At Ryömälä, mostly very worn, though only ♂s were seen, rather large and lightly coloured.

Leptosis sinapis.—A few, worn, at Ryömälä and Ahvenusjärvi; quite typical.

Colias palaeno.—Not uncommon at Ahvenusjärvi and Sylkynjärvi; apparently confined to the marshes. The ♂s are rather small and pale in tint, with rather narrow border; the ♀s larger, white, with broader border; the former are unlike any other race that I know.

Argynnis aglaia.—At several places, not uncommon at Savonlinna, but wild and difficult to catch. All those taken were small, ♂ 58mm., ♀ 56mm. of the ab. *nana*, which here seems racial.

A. niobe.—Just coming out at Savonlinna and Punkaharju; rather small, but rather heavily marked un.s.

Issoria lathonia.—At Mouhijärvi; large and bright.

Brenthis euphrosyne.—At most places visited, but nearly over; small and dark, approaching and sometimes reaching the form *finjal*. The antemarginal spots un.s.h.w. very pronounced, giving a distinct look of *B. aphirape*.

B. selene.—Abundant everywhere; generally rather small. Many specimens from the railway bank at Savonlinna tiny; one ♂ only 32mm. On one of the islands at Savonlinna Dr. Scott took a ♂ with a broad black central band up.s.f.w., and at the same place on a subsequent day I took a ♀ with pale clay-coloured ground up. and un.s., very fresh.

B. aphirape race *ossianus*.—In the marsh at Sylkynjärvi, and the moss at Ahvenusjärvi, but worn in both places, and not common. The specimens are rather larger and slightly duller than those from Lapland.

B. arsilache.—Abundant in the marshes; rather smaller than the Belgian specimens from Hockai, but generally larger than the Swiss specimens from the Engadine; the ♀s also lighter than the last named, and also than those from Hinterzarten in the Black Forest. The undersides from all localities vary very little.

B. ino.—Not common, but occurring in damp spots in most localities; rather below average size and rather light in colour, esp. the ♀s; the amount of purple un.s.h.w. varies a good deal in different specimens.

Melitaea maturna.—Only at Savonlinna; one ♀ is very bright, but all the other specimens are rather worn. The ♂s are of the *uralensis* form, the light bands up.s. being almost white; this is also the case with one of the ♀s. Only a few specimens were seen, and the race, as a whole, may be taken to be *uralensis*.

M. athalia.—Not uncommon, especially at Ryömälä; except for one ♀ with rather obsolete markings up.s., the specimens are quite typical.

M. dictynna.—Dr. Scott took one ♀ at Mouhijärvi, with very dark ground colour, but with the antemarginal spots up.s.h.w., and some of those on f.w. nearly white; only one other specimen was seen.

Aglais urticae.—Only a few, and with no tendency towards the *polaris* form.

Polygonia c-album.—One very worn specimen at Mouhijärvi.

? *Limenitis populi*.—Probably one ♀ at Sylkynjärvi.

Pararge maera.—Very abundant everywhere; ♂s with very little rust-colour up.s.f.w. some being of the *monotonia* form. One very small ♂, 40mm., from Hango. The un.s. very strongly marked in all specimens.

P. hiera.—A few at Mouhijärvi and Punkaharju, but too worn to keep; said to be very common in Finland.

P. aegeria race *egerides*.—Very few at Mouhijärvi, and quite worn out.

P. achine.—One small ♂ at Borga, which unfortunately met with an accident and was spoilt.

Aphantopus hyperantus.—Just coming out at Borga, abundant at Ryömälä and elsewhere around Mouhijärvi, also at Sylkynjärvi; very fresh, but of small size.

Coenonympha iphis.—Abundant at Borga, and common at Ryömälä and Ahvenusjärvi; of average size, the eye-spots un.s.h.w. varying in size especially in the ♀.

C. pamphilus.—Not very common, rather worn, and pale in colour.

C. tiphon.—A few at the edge of the lake at Ahvenusjärvi; small, without spots up.s., spots on f.w.un.s. very small, two at anal angle of h.w. very small but pupilled, the other four being merely white dots:—a very poor form.

Epinephele jurtina.—Just coming out at Hango; only one ♀ taken; small, 42mm., the orange suffusion f.w.up.s. rather small and light in colour.

Hipparchia semele.—Only at Hango, but abundant there and very fresh; rather small, but with dark un.s.; strongly marked:—a very handsome race.

Erebia ligea.—A few just coming out in the wood at Ryömälä; smaller than the average, 48mm., very dark up.s. with only two, or sometimes three, eyespots up.f.w., and very little white on un.s.h.w.

NOTE.—All measurements are taken from centre of thorax to tip of f.w. × 2.

The Early Stages of Indian Lepidoptera.

By D. G. SEVASTOPULO, F.R.E.S.

(Continued from p. 138.)

Catopsilia crocale, Cr.

Moore, *Lep. Ceyl.* I. 122, plt. 48, figs. 1, 1a and 1b (1881).

Bell, Jr. *Bomb. N.H.S.* 570 (1897).

Typical Pierid larva. Head green with minute black dots. Skin of the body very rough, green with minute black dots. A white spiracular line, above which is a black dotted one and below an olive green stripe. Ventral surface whitish green.

Pupa boat-shaped with the thorax slightly keeled and the head produced to a point. Two colour forms. The one apple-green with a yellow line on the thoracic keel and another lateral one running from the head along the dorsal edge of the wing-case to the tail. The other form grey-green, a dark brown dorsal line and a pale lateral one. The wing cases and the side of abdomen suffused with dark brown striae. Suspended by a girdle and tail pad.

Foodplant.—*Cassia* sp.

Described from two full fed larvae found in Calcutta 7.ix.31, pupated 9.ix.31 and two females emerged 14.ix.31.

Seitz described the pupa as having black tubercles.

Terias hecabe, L., *hecabe*.

Moore, *Lep. Ceyl.* I. 118, plt. 45, figs. 1, 1a-1c (1881).

Bell, Jr. *Bomb. N.H.S.* X. 570, plt. 6, figs. 5, 5a (1897).

Typical Pierid larva, green with a white spiracular line. The skin rough.

Pupa with thorax slightly keeled. Very variable in colour. Some grass green with a dorsal line and a black spot at the base of the wing cases; others have in addition a square black subdorsal spot on the

2nd abdominal somite and others again have the wing cases more or less suffused with black and black lateral suffusion.

Foodplant.—*Cassia* sp.

Described from a batch of nine full fed larvae found in Calcutta 17.x.31, pupated 19.x.31 and five males and four females emerged 24.x.31.

Seitz states that the larva has a large black head, this was not the case with my specimens.

Pareronia valeria, Cram., ssp. *hippia*, F.

Bell, Jr. *Bomb. N.H.S. X.* (1897).

Typical Pierid larva, bright green with a pale dorsal line. Legs pinkish. A lateral fawn coloured blotch of granular appearance on the 4th and 11th somites. A series of oblique dark lateral lines from the 5th to the 10th somite. Anal plate projecting and slightly forked.

Pupa compressed laterally. Wing-cases very large. The head produced into a beak forming an almost unbroken curve with the dorsum. Colour whitish green with a dark dorsal and pale lateral line. 2nd abdominal somite with a pair of small black dots. Wing cases with a red central and a series of white submarginal spots.

Foodplant.—*Capparis* sp.

Described from a full fed larva found in Calcutta 10.i.31, pupated 12.i.31 and a female emerged 22.i.31.

Seitz describes the larva as being green but mentions no markings. He compares the shape of dorsal distal margin of the pupa to that of an enormous sun helmet.

DANAIDAE.

Danais chrysippus, L.

Moore, *Lep. Ind.* I. pl. 8, p. 36 (1890).

Head grey with two black rings. Ground colour grey, 1st to 11th somites each with a black transverse central stripe and a black line on each side. The 2nd to 11th somites each with a pair of subdorsal elongate yellow spots. 12th somite with a transverse yellow stripe edged with black. 2nd, 5th, and 11th somites with a pair of subdorsal black filaments, those on the 2nd longest and pointing forward, the base of the pair on the 5th somite reddish. A yellow lateral stripe. Legs black. Claspers black banded with grey. Anal plate black. Ventral surface blackish with a few grey dots.

Two pupal forms, the one blue-green, the other pinkish-buff. Both with a golden spot on the eye, one in the middle of the wing case, one at its base and two near the lateral edge of the meta-thorax. The abdomen with a dentate ridge on the 4th somite, black anteriorly and gold posteriorly. Cremaster black. Suspended by the tail from any suitable support. The green form is usually found among leaves, the buff form in other situations.

Foodplant.—“Ak” (*Calotropis procera*).

Described from a full fed larva found in Calcutta 27.x.31, pupated 29.x.31 and a male emerged 6.xi.31.

Seitz mentions a wax-yellow pupal form, but I have never seen it.

(To be continued)

Paris and Mouthier (Doubs.) in July-August, 1932.

By LIEUT. E. B. ASHBY, F.R.E.S., F.Z.S.

(Concluded from page 123.)

August 10th.—This morning I again walked up to "Le Moine." It is important to start this walk early, as there is but little shade on the way up until the woods are reached. A small image of the Blessed Virgin in a small natural grotto with the date 1915, on the right of the path through the woods, and opposite to the first clearing mentioned under July 29th, will serve to clinch this walk for those who may come after me. To-day I walked far up, past the second clearing on right, and beyond the woods; past the small farm house on left, and straight along the flat, keeping to the only track. Where this divides, I took the right fork leading through a delightful uncut mountain meadow in the fir zone, above which several buzzards hovered. I was told at Mouthiers that these birds frequent these crags as far as Pontarlier. When the path narrowed I stopped and rested under the shade of the pines owing to the great heat. Otherwise I should have followed the path, which I feel sure would shortly have brought me out into the Longeville Road and the presence of *Apatura iris*, though I had already seen it in small number on all the high ground.

During the whole day I took a specimen of the Hymenopteron *Lissonotus nigripes*, H.-S.; 2 males of *A. iris*; 1 male of *Heodes virgaureae* (worn); I also saw but did not succeed in taking a fresh male of *Chrysophanus hippothoe*. Perhaps the most interesting insect I got was a female of *Argynnis niobe* with increased tendency to black markings on the upper wings. This beautiful dark form I have never found common anywhere so far. In the forest on the way back I disturbed and boxed a specimen of *Necrophorus mortuorum* as this beetle was feasting on a small carcass, and I took a specimen of the beautiful purple beetle *Chrysomela luctuosa* and also one of *Leptura melanura*, E., and the moth *Eubolia limitata* completed the interesting features of to-day's catch.

August 11th.—This afternoon I walked along the Pontarlier road, and some way on after passing under the Cascade on left, and not long after the path marked Source de Pontet (on right) is passed, there was an entrance to a large field still uncut on left. During this walk *Erebia aethiops*, var. *violacea*, Wh. was very abundant; I also took the moth *Callimorpha quadripunctaria* (hera); the butterfly *Araschnia levana* f. *prorsa* and two bees *Osmia calmentaria*, Gerst., and two fresh specimens of *Hipparchia dryas* were seen. I also took 3 specimens 1 ♂ and 2 ♀s of *A. niobe* var. *eris*, the Diptera *Conops flavipes*, L. and *Tabanus bovinus*; and the beetle *Cryptocephalus aureolus*, Suff. At dusk the moth *Botys ruralis*, Sc., swarmed among nettles with a few *B. urticae*.

August 12th.—This morning, carrying my lunch, I ascended to the Rochers du Haute-Pierre, collecting *en route*. I was interested to find soon after leaving Mouthier on the ordinary road, some fresh specimens of *Hipparchia dryas*. These, all males, increased in number as I walked on, but had apparently not emerged at Haute-Pierre itself.

The fresh males of the second brood of *Colias hyale* were much in evidence. On the summit by the cross, fresh specimens of *Papilio machaon* and *P. podalirius* were vieing with *Parnassius apollo* for possession of the scabious blossoms. Two worn specimens of *Enodia dryas* taken here are an enigma to me. Fresh *Brenthis dia*, *Zygaena carniolica*; a single fresh female of *Loweia dorilis*; and of *A. niobe* var. *eris* completed a rather more varied day's bag than usual. The females of *Agriades coridon* were now getting common and I took a fine female of the var. *syngrapha*; also fresh specimens of the moths *Pseudoterpna pruinata* and *Epirrhoe tristata*. It is possible to see Mt. Blanc from the summits of Haute-Pierre on a very clear day; but I could not distinguish it to-day owing to the haze.

August 13th.—A very heavy thunderstorm to-night lasting about half an hour, with hailstones as large as bullets, may break up the long period of fine weather. Such a storm is well calculated to injure permanently the vines, which are already much retarded.

August 15th.—A National Fête Day and the hottest day here this year I am told. Our one through road from Pontarlier to Lods and onwards was much crowded by motor cars. I was on this road from 9.15 a.m. to 5.15 to-day and got a nice selection of *E. dryas*; and a few nice specimens of *C. quadripunctaria* (*hera*); some more females of *E. aethiops* var. *violacea*, Wb. Nothing else of additional interest was seen in my walk as far as the little Café de la Creuse and back. *Eugonia polychloros* was still on the wing to-day. I took the Neuropteran *Chrysopa vulgaris*, Schm., also the Dipteran *Anthrax villa singulata*, Mg.

August 17th.—The heat wave continued and I collected on the first part of the road which leads up in the direction of Haute Pierre this morning; after some vain attempts to capture a fine female of *A. iris* on the road, I had to content myself with the capture of some more males of *E. dryas* still quite fresh. I saw one fresh specimen of *Euvanessa antiopa* at a short distance from the road. I also took a small specimen of the moth *Eremobia ochroleuca*, Esp. on the flowers of thistle, and one nice specimen of the bee *Halictus sexcinctus*. Last night along the main road of Mouthier and in our hotel garden, females of the beetle, *Lampyrus noctiluca*, L., were in full luminosity.

I was sorry to leave this very pretty district, and the life of the hotel; perhaps, had the heat been less great, especially during the last week, I could have obtained a more representative list of the insects of this district, which is perhaps not so well known to British Collectors.

August 18th.—I left this evening at 9 p.m. to catch the through night train from Pontarlier to Paris, which from the point of view of the fragile contents of my luggage gives the best connection for London via Dieppe and Newhaven. In conclusion may I express my best thanks to those Naturalists who have again helped me to make this paper correct.

A Few of the Newly Described Forms of Species that occur in the British Isles.

During the present year the following new forms and names of British species of Lepidoptera have been announced in the pages of the *Int. Ent. Zeit.* Three other forms announced in the latter half of last year are also included.

1. *Xylomiges conspicillaris* subsp. *anatolica*, Hering.—“The ground is almost pure grey, without the brownish tone of the typical form, but not so blackbrown as in the *melaleuca*, View., form taken with it. This somewhat brownish tone is found strongest on the paler costal area before the apex. It is clearly distinguishable from European examples by the pure grey coloration and the more distinct marking.” *Anatolia*. Vol. XXVI. p. 412 (1933).

2. *Acronicta megacephala* subsp. *ankarensis*, Hering.—Distinguished by the ‘Pure white clear space standing distal from the transverse vein, moreover there runs from there a double white filled in cross line to the inner margin.’ *Anatolia*. *l.c.*

3. *Arctia villica*, L. ab. *wambachi*, v.d. Goltz.—“The R. side is quite normal, the L. unicolorous sooty black without any trace of marking.” Bred from larva from Wismingen. *l.c.* p. 87 (1932).

4. *Euchloë (Anthocharis) cardamines*, L. ab. *transvestita*, Müll.—“The orange colour of the ♂ forewing is represented only by a quite light grey shade, which is almost exactly like the colour in a female.” *Berlin*. *l.c.* p. 155 (1932).

5. *Pyrameis cardui*, L. ab. *johni*, Fischer.—“Is distinguished from the ‘cold form’ ab. *wiskotti*, in that the first intercostal area of the forewing is very strongly darkened throughout, and the black colour has so much extended over the rest of the wing, that of the usual pale red ground only an area of the outer third of the cell besides a smaller spot above and also two below vein (IV(1) are present. The white spots are unvaried, at most only somewhat smaller. The hindwings are also darker than in *wiskotti*.” *l.c.* p. 158 (1932).

During the past year 3 new forms of species of Lepidoptera occurring in Britain have been described and named in the *Mitt. Münch. Ent. Gesell.*

(1) *Cidaria (Thera) variata*, Schiff. ssp. *subtaurica*, Wehrli.—“In this, as in the extremely variable race in Europe, the colour is very clearly grey, mixed with white, sometimes mixed with brown as it were dusted; the subbasal band distinct, the basal area usually light, the central band narrow towards the inner margin, light brown, slightly ragged distally, black edged, often bordered by a lighter band, the white waved line usually distinctly sharply toothed. On the extreme edge of the central area there is a larger, prominent, white subcostal spot.” *l.c.* p. 5 (1932) *Marasch*. *Asia Minor*.

(2) *Geometra papilionaria*, L. ab. *diffusata*, Marschn.—“The ground colour of all the wings is of a quite untoned green. The rows of white spots on the upper side of both fore- and hind wings are not apparent. The whole of the veins of both fore and hind wings, as well on the upper as on the undersides are exactly alike unvaried, but on both sides in the immediate neighbourhood the wing membrane is uncolored and shows ivory like.” *Salzburg Alps*. *l.c.* p. 13 (1932).

(3) *Epinephela jurtina*, L. ssp. *maraschi*, Pfeiff.—“The ♂ resembles on the upperside the best Rivieran examples, only that the

apical eye is always distinctly white centered. The fore-wing under-side shows a dull brown-yellow with very narrow marginal area. The hind-wing under-side is earth-brown with not a trace of the central line. Four to five eyes surrounded with yellow-brown are always present. On the upper-side of the female the light yellow-brown spot is broad and the prominent large apical eye is lit up with strong yellow. The extension of the yellow-brown spot nearly approaches that of the subsp. *hispulla*, Hb. The ground colour of the underside forewing agrees with the upper side. A double centered apical eye is present, in *hispulla* only a single. The ground colour of the underside hind-wing is chocolate-brown with violet suggestion. Immediately after the black-brown middle-line lies a yellowish scale patch, which is followed by a broad light violet brown band. The marginal band is again like the inner part. The eye dots are very small and reduced, their number 0-3." Marasch, Asia Minor. *l.c.* 24 (1932).

SCIENTIFIC NOTES AND OBSERVATIONS.

UNUSUAL BEHAVIOUR OF LARVAE OF *TORTRIX VIRIDANA*.—It is curious that the phenomenon described by Mr. Donisthorpe (p. 140) is supposed not to have been observed before, because it is quite well-known to frequenters of Epping Forest, and when the larvae are exceptionally abundant, somewhat of a nuisance to visitors. I myself have often seen the threads reaching from the highest branches to the ground, as Mr. Donisthorpe says, but I do not remember ever seeing "hundreds of larvae on each cord." I wonder whether he noticed how each larva was attached to the cord—if head downwards as if crawling down, or head upwards as if suspended by the cord. If the latter was the case then each larva was spinning its own thread and the cord would be a compound cable formed of many threads. When *Hybernina* larvae and others have been abnormally plentiful I have seen the trunks of horn-beams and oaks stripped of thin foliage covered with broad ribbons of silk spun by the countless larvae ascending or descending the trees probably in search of fresh food.—C. NICHOLSON, Tresillian, Cornwall.

TUTT'S BRITISH NOCTUAE AND THEIR VARIETIES.—The Editorial note on p. 144 reminds me to ask whether it has been noticed that *Agrotis suffusa* has not been described in its proper place, next to *saucia*, in Vol. 2, although it is referred to several times on p. 4. I can find no mention of it in the Appendix in Vol. 4, but presume the omission will be rectified in the *Supplement*, Vol. 2. May I suggest that in future the name of each species be printed in bold type at the head of the description in order to facilitate reference, as there are so many short paragraphs, "original descriptions," and italic names that it is not easy to tell where the notes on each species commence, unless one glances carefully down every page.—C. NICHOLSON, Tresillian, Cornwall.

[Tutt treated *Agrotis suffusa*, Borkhausen, under the prior name *A. ypsilon*, Rottemburg. There is another Noctua which was for a long period called *ypsilon* but the prior name of that is *fissipuncta* under which name Tutt dealt with that species. For some time past a thick line has been inserted at the end of each species with a double space. In Vol. II. the generic and specific names will be emphasised.]

NOTES ON COLLECTING, etc.

NOTES FROM EAST TYRONE.—We have had a wonderful season here; *Adscita statices* was flying in dozens in damp meadows during June; *Euchloë cardamines* appeared in great numbers and several interesting aberrations occurred, including a ♂ without discal spot on forewing. *Melitaea aurinia* was found in abundance in North Armagh, a new locality for the species; at the same time *Hemaris tityus* was common at Lousewort (*Pedicularis*).

On August 29th, two ♂s of *Colias croceus* were observed, a first record for the county. A fine dark ♂ *Herse convolvuli* ab. *virgata*, Tutt, was brought to me; the same evening at dusk several were flying over beds of *Nicotiana*, one netted was in a much worn condition; during the following week I received a number from various parts of this district. *Pyrameis cardui*, *P. atalanta*, and *Vanessa io* have been very abundant in meadows at Scabious, and *atalanta* is still about on ivy blossom.—THOMAS GREER, Milton, Dungannon, October 12th, 1933.

A UNIQUE VARIETY OF *ARCTIA CAJA*.—After seeing a number of larvae of *Arctia caja* last June I casually boxed one, and gave it a lettuce leaf to finish feeding up. On July 3rd I looked in the box and found a most wonderful pale specimen had emerged the same day; the usual latticing of the forewings is faintly outlined in pink, the large costal blotch is eliminated except for its tip, the next one is considerably lessened, the one on the outer margin is normal, the first on the inner margin is represented by a few dots, the second is rather smaller than usual; on the whole the markings are slightly asymmetrical and where the usual chocolate marking has been eliminated its place is taken by buff: the hind wings are pale red, almost pink and instead of the usual black spots they are buff and inconspicuous; the thorax has narrow side stripes of the usual colour with a paler central stripe; instead of a narrow red collar, at the neck the red extends over the head almost to the antennae; the hind legs are paler than usual.

It is a female specimen with a wing span of about $2\frac{1}{2}$ inches.—J. W. SAUNT (A.L.S.), 119, Bulls Head Lane, Stoke, Coventry. October 30th, 1933.

CURRENT NOTES AND SHORT NOTICES.

A meeting of the Entomological Club was held at The Museum, Tring, on August 19th, 1933, Lord Rothschild, F.R.S., in the Chair. *Members Present* in addition to the Chairman:—Mr. Robert Adkin, Mr. Horace Donisthorpe, Mr. H. Willoughby-Ellis, Mr. Jas. E. Collin. *Visitors Present*:—Mr. H. L. Andrewes, Mr. E. C. Bedwell, Dr. Malcolm Burr, Dr. W. T. Calman, Dr. E. A. Cockayne, Mr. C. G. M. de Worms, Dr. F. A. Dixey, Mr. H. N. Edleston, Mr. S. S. Flower, Major Philip Graves, Capt. Francis Hemming, Major R. W. G. Hingston, Mr. H. R. Hewer, Dr. Karl Jordan, Mr. John Levick, Mr. F. Shaw Mayer, Dr. S. A. Neave, Mr. W. P. Pycraft, Capt. N. D. Riley, Dr. Hugh Scott, Mr. W. Rait Smith, Mr. H. Stevens, Mr. W. H. T. Tams, Mr. Henry J. Turner, Mr. C. J. Wainwright, Rev. George Wheeler. The members

and guests were received by Lord Rothschild at the Museum, and the vast entomological collections were open for inspection. Many of the guests availed themselves of the opportunity of seeing the sections of the Lepidoptera in which they were interested, and Lord Rothschild made special exhibits consisting of approximately 100 drawers of the American *Aristolochia*-feeding Papilios, especially noteworthy among which were the large series of *Papilio orellana*, Hew., and the ♀ of *Papilio hohneli*, Stdgr., also 46 drawers of American *Callimorphidae* (*Pericopinae*). Especially noteworthy were two drawers of gynandromorph lepidoptera, the most remarkable being one of *Orygia antiqua*, the "vapourer" moth, one of *Ornithoptera haliphron* and an example of *Colias edusa* with two wings normal ♀ and two wings white *helice* ♀; finally a drawer of varieties of *Papilio machaon*, nine British and eight Continental. There were eight black examples from Norfolk and one pale almost entirely yellow one from Wicken Fen. Of the Continental specimens only one was entirely black. Further, the comprehensive collection of British Lepidoptera was also available in which Lord Rothschild takes great interest, and to which considerable additions are being continually made. Luncheon was served at 1 o'clock, and after a business meeting of the Club the party retired to the Museum and again interested themselves in the collections. A most enjoyable and instructive day was spent, and the members and visitors dispersed by various trains soon after 4 o'clock.—H.W.-E.

REVIEWS AND NOTICES OF BOOKS.

A book has come to our table written by our colleague Dr. Malcolm Burr. *A Fossicker in Angola*, published at the "Figurehead," 18, Adam St., Adelphi, W.C.2. It is a book comprising an entertaining and informative study of a land about which little is known or has been written. During two years while prospecting in Africa, the greater part of the time in Portuguese Angola, the Author carefully observed everything which came within his reach. Happily he saw the lighter side of adventure, as is revealed in the pages of the book. An experienced traveller in many parts of the Eastern Hemisphere, and an unusually competent linguist, as well as a good all round naturalist, he was able to make the most of everything he encountered. A book of travel and adventure. Is the absolutely necessary map provided? Yes, and a few illustrations, in one of which the author is seen with his inseparable friend and helper Nazarov the Russian. To select from the wealth of information and incidents is difficult, but perhaps we may tell of the behaviour of a household parrot, who would not rest at night until it had its newspaper and a "sundowner"—the former it chewed and swallowed—the latter consisted of a few beakfuls of whiskey to wash it down. There was a contortionist who sat down on his own stomach, an incident which recalled to mind a lady who sat on her own head. We have a figure of this remarkable feat which was performed many many years ago. The remarks of the author on the relation of the Charleston to the native dances is an interesting subject for the anthropologist to consider. The curious habit of a Hesperiid to absorb moisture from its own body, the drink habits of butterflies, the extraordinary mimicry shown by the

Orthoptera are all instanced and the author expresses himself strongly on Animal Hunting—that there are “only three motives to justify the taking of animal life: food, self-defence, and scientific purposes. All we can say is Get the book, its price is only 5/-. Read it, and you will read it again and you will feel that you have been with the author to wild Africa, and have learned much of the inner life of the natives and much of that wonderful land, which in our young days was a terra incognita and Livingstone the only man in the world who knew its secrets. The book is well produced and a handy little volume for the pocket.—Hy.J.T.

The Government of India have recently published the Second Series of *Life Histories of the Indian Microlepidoptera*, by T. Bainbrigge Fletcher, R.N., F.L.S., F.R.E.S., F.Z.S., containing something of the life-histories of some 250 species. In 1921 similar information was published of 400 species, by the same author, so that now there is a considerable amount of information available of the life-histories of 650 species of Indian Micro-Lepidoptera. The name of the author is sufficient to satisfy students that the matter is as correct as possible, the results of much practical research by his well-trained staff. These 2 later volumes are illustrated by 35 and 77 plates of which a few are in colour. Each comprises the life-history of one species, all figures being much enlarged $\times 6$ to $\times 18$ and more. Special attention has been called to those species which are known to be, or likely to prove to be, pests. The author is a practical worker and has, for more than the 25 years he has spent in India and Ceylon, worked enthusiastically with the smaller fry, and is one of the few world naturalists who know aught of tropical micros. The last volume was published since the author left India and as he had no chance of reading the proofs there are numerous misprints. Not only these, but the plates have been very poorly reproduced by the Government Press. There are a good many blobbed details with marginal scratches, extraneous appendages at irrational places, bulbous hooks, etc. The figures are too large in many instances. If a larva be pictured by a large figure, surely the setae could be correctly positioned. Comparison with the finish of these plates with those done in *Indian Insect Life* and *Some South Indian Insects*, in which the blocks were made by really good block-makers, will show the failure. We have always questioned whether so great an enlargement of such small insects is really an aid to identification. It has struck us that it is practically impossible to draw much enlarged figures of obscurely marked micros and give a satisfactory representation of such, sufficient for one ignorant of the species to identify it. This is our personal opinion and experience, but we know that the author's opinion and experience is strongly in favour of such enlargements to allow of the inclusion of sufficient minute detail to aid in identification. As the author is an expert on the nomenclature of the Micros one can rely on the correctness of the naming. Unfortunately there is no Index, again probably due to the fact that the author did not see the proofs. Let us hope that Mr. Fletcher's successor will carry on this work as it is among the micros that many of our very worst pests are to be found.—Hy.J.T.

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Duplicates.—S. Andrenaeformis, Bred 1928, well set on black pins, with data.

Desiderata.—Very numerous British Macro Lepidoptera.—J. W. Woolhouse, Hill
House, Frances Street, Chesham, Bucks.

Desiderata.—Species of Dolerine and Nematine sawflies not in my collection; list
sent.—R. C. L. Perkins, 4, Thurlestone Road, Newton Abbot.

Duplicates.—Albimacula*, sparganii*.

Desiderata.—Ova of D.oo. pupae of X. gilvago, D. caesia. A. J. Wightman, "Aurago,"
Bromfields, Pulborough, Sussex.

EXCHANGES.—Living Eggs of Catocala fraxini and sponsa, exchange for butterflies of
British Isles.—C. Zacher, Erfurt, Weimar, Street 13, Germany.

Duplicates.—Pyalina*, Salicis, Ianthina*, Orbicularia*, Repandata in variety,
Doubledayaria, Black rhomboidaria*, Black virgularia* and others.

Desiderata.—Hyale, Welsh aurinia, Polychloros, Tiphon Agathina, Lunigera,
Lucerneae, Neglecta, Diffinis, Populeti, Gothica v. gothicina, White Leporina, Tridens
Putrescens, Littoralis, Typhae v. fraterna, Rurea v. Combusta, Gilvago, Fulvago v.
flavescens, Liturata v. nigrofulvata. Harold B. Williams, Woodcote, 36, Manorgate Road,
Kingston Surrey.

Duplicates.—A large number of species of European and Palaearctic Rhopalocera
and Heterocera.

Desiderata.—All British species especially those illustrating characteristics of an
island fauna. Dr. Lor. Kolb, München 54, Dachauer-str. 409, Germany, and Franz
Daniel, München, Bayer-str. 77, Germany.

Desiderata.—Living larvae or pupae of Lasiocampa quercus. Also set specimens of
same species taken before 1910 in Devon or Cornwall.

Duplicates.—Payonia, set specimens or living stock: Monacha, ova: ochroleuca,
griseola, advenaria, juniperata, thetis, etc.—J. A. Doucet, 5, Trinity Road, Wimbledon.

URGENT.—Wanted English (Cumberland) Erebia epiphron. Adequate exchange
will be made in European Lepidoptera.—B. C. S. Warren, 14, Avenue de l'Eglise
Anglaise, Lausanne, Switzerland.

I am seeking an opportunity of exchanging Macro- and Micro-Lepidoptera with
English collectors and beg to send list of duplicates.—J. Soffner, Trautenau (Bezirksbehörde),
Bohemia, Tschechoslowakische Republik.

CHANGE OF ADDRESS.—T. Bainbrigg Fletcher, R.N., F.L.S., F.Z.S., F.R.E.S., to
"Rodborough Fort," Stroud, Glos.

S. G. Castle-Russell, to "The Homestead," Crawley, Winchester, Hants.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7.
8 p.m. November 15th, December 6th.

The South London Entomological and Natural History Society, Hibernia
Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m.
November 23rd, December 14th.—Hon. Secretary, S. N. A. Jacobs, "Ditchling," Hayes
Lane, Bromley, Kent.

The London Natural History Society.—Meetings first four Tuesdays in the
month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel
Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through
Members, or from the Hon. Sec. A. B. Hornblower, 91, Queen's Road, Buckhurst Hill,
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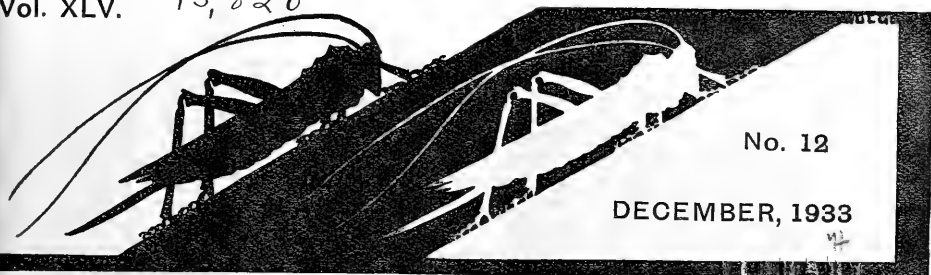
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The South London Entomological Society. Annual Exhibition.

On the evening of October 28th, the South London Entomological Society held its Annual Exhibition and Conversazione when more than 200 members and friends met to view the large number of exhibits brought by some 60 exhibitors. The Society's reference collections of all Orders, to which valuable additions have been made recently, were on view. The exhibits duly labelled were displayed on tables and later in the evening light refreshments were arranged.

Mr. R. Adkin exhibited specimens representative of the species taken in his Light Trap during the present season at Eastbourne, a series of the very local *Blastobasis lignea*, the 2nd and 3rd known British specimens of *Nepticula decentrella*, and a long series of *Epunda lutulenta* recently taken at Eastbourne.

Rev. E. B. Ashby exhibited the very local North European species *Odezia tibiale*, taken in Finland by Dr. E. Scott, and a varied series of *Ochria aurago* taken at ivy blossom near Ashford in mid-September.

Mr. R. W. Attwood exhibited a local collection of moths from South Benfleet, Essex, taken in 1931-1933. The exhibit included among other species *Eumorpha elpenor*, *Pygaera curtula*, *Palimpsestis or*, *P. duplaris*, *Dasychira pudibunda*, *Poecilocampa populi*, *Arctia villica*, *Cosmotriche potatoaria*, several species of *Agrotis*, *Noctua*, with *Hydroecia micacea*, *Nonagria geminipuncta*, etc.

Mr. Blyth exhibited a specimen of *Melitaea varia* from Nevache, Hautes Alpes, having normal R. wings but the L. wings of quite a different pattern.

Mr. G. A. Brett exhibited living larvae of *Hemerophila abruptaria* feeding on privet, with set imagines of the two previous generations, the original parents being ♂ *f. fuscata* and ♀ normal.

Mr. P. M. Bright exhibited two large cabinet drawers of many beautiful and remarkable aberrations of British Rhopalocera.

Mr. A. A. W. Buckstone exhibited a ♂ *Colias hyale* taken at Bookham in September, having forewings clouded yellow as in *C. croceus* typical ♂ and the hindwings normal *C. hyale*; also a series of bred and captured *Polygonia c-album* of both broods from Sussex and Surrey in 1933.

Dr. G. V. Bull exhibited striated forms of *Polyommatus icarus* from Lympe, September, 1933, and *Agriades coridon* from Royston, 1924; also a series of *Aplecta occulta*, from Rannoch, June, 1933, and an asymmetrical *P. c-album* bred in September, 1933.

Mr. R. C. R. Crewdson exhibited a large number of species taken in various parts of Gt. Britain during the present year, including *Acrionicta myricae*, *A. menyanthidis*, *Mamestra glauca*, *M. contigua*, *Plusia interrogationis*, *Hyppa rectilinea*, *Anarta melanopa*, *Thamnomia brunneata*, *Eutephria caesiata*, etc., from Rannoch; *Pachnobia leucographa*, *Lobophora polyommata*, etc., from Grange, Lancashire; *Agrotis cinerea* from Shoreham, Kent; *Colias hyale*, *Leucania albipuncta*, etc., from Kent; with species from Caernarvon, Sussex, Rossshire, etc.

Mr. H. M. Edelsten exhibited melanic and banded forms of *Amphipyra pyramidea*, *Phorodesma pustulata* of a creamy pink colour, *Ephyra pendularia* with a rosy band across all wings, *Coremia designata* with a very narrow band on the left upper wing, all from mid-Sussex;

two *Zygaena lonicerae* with six spots on the forewings, and *Phryxus vulgaris*, a parasite which emerged from a larva of this species, from Wood Walton Fen, etc.

Mr. A. F. O'Farrell exhibited a *Manduca atropos* from S. Cornwall, September, 1933; *Leucania vitellina*, taken at grass flowers at the same place; a series of *P. c-album* from Effingham including an asymmetrical specimen; a *Rumicia phlaeas* with the hindwing band replaced by streaks=*ab. radiata*; the pale undersized race of *Saturnia pavonia* from S. Cornwall, etc.

Mr. L. T. Ford exhibited an addition to the British List of Micro-Lepidoptera, *Gracilaria pyrenaella*.

Mr. Hawkins exhibited imagines, larvae and cocoon of *Parascotia fuliginaria* from Surrey, 1933; also a number of aberrations of British Lepidoptera.

Mr. H. C. Huggins exhibited a number of rare species and aberrations of Pyralids, Phycitids, Crambids and Tortrices.

Mr. F. W. J. Jackson exhibited various degrees of *ab. obsoleta* of *A. coridon* and other aberrations; also *Colias croceus ab. helice* taken in the Isle of Wight in 1932 and 1933.

Mr. S. N. A. Jacobs exhibited imagines and living material of the fruit pest *Aphomia gularis* now being found in numbers in the City warehouses.

Dr. Norman Joy exhibited many species of Lepidoptera including forms of *Papilio dardanus*; also skins of the Arctic and Common Terns.

Mr. Harold King exhibited a case of Dorset Lepidoptera.

Mr. H. A. Leeds exhibited four cases with aberrations of British Rhopalocera named under the cumulative method initiated by the late W. J. Tutt. For some of the *Lycaenidae* Courvoisier's aberrational names were used.

Mr. C. G. Lipscombe exhibited *Brenthis selene*, a very pale form and a dark suffused forms; *Aphantopus hyperantus* ♂♂ of the form *lanceolata*; a *striata* form of *P. icarnus*; and *Coenonympha pamphilus* of a very pale cream white colour and also a very dark specimen, etc., all from the Aldershot area.

Rev. J. N. Marcon exhibited a large number of aberrations of British Rhopalocera of which the more striking were a rayed ♂ of *Brenthis selene*, Chiddingfold; a rayed *Melitaea cinxia* from Swanage; an *Agriades thetis* of an extreme *digitata* form, another with white underside and another *ab. obsoleta* with white underside; *Rumicia phlaeas* forms showing extreme development of pear-shaped markings, another with the upperside mostly black, two *ab. schmidtii* and one of the very rare *ab. alba*. He also showed three yellow aberrations of *Zygaena trifolii* from the Cotswolds.

Mr. W. F. Mellows exhibited aberrations of *Arctia caja*.

Mr. H. Moore exhibited a case of Butterflies obtained within the Rotherhithe district of S. London, not far removed from London Bridge.

Mr. A. Morley exhibited Lepidoptera from the Folkestone district obtained during 1932 and 1933, including *ab. minor* (22mm.) of *C. pamphilus*; *ab. corydonis* of *A. coridon*; *ab. minor* (21mm.) of *A. thetis* (*bellaryus*) also *ab. pallida* and several partially *ab. obsoleta*, two *ab. discoidalis-nulla*, an *ab. crassipuncta*, etc.; *ab. nigrocincta* of *Senta*

maritima, which species has not hitherto been recorded from Romney Marsh; ab. *flavescens* of *Metachrostis perla*; the *pallida* form of *Haedena pisi* which is very rare in Gt. Britain (Tutt); a variegated *infuscata* form of *Xylophasia monoglypha*; a *canaria* form of *Amathes lychnidis* (*pistacina*) not previously recorded from Britain; a *fasciata* form of *Operophtera fagata* (*boreata*); etc.

Mr. W. G. Nash exhibited ab. *lanceolata* of *A. hyperantus* and a *Venilia maculata* with a broad black band across the forewings, from the New Forest, etc.

Mr. L. W. Newman exhibited a large number of aberrations of British Lepidoptera obtained by him during the season, and including Mr. G. B. Oliver's magnificent homoeotic *R. phlaeas* one hindwing small and like a forewing in colour and markings.

Mr. F. Pennington exhibited *Leucania l-album* from Cornwall, September, 1933, and various aberrations of Lepidoptera.

Mr. C. G. Priest exhibited bred and captured Lepidoptera from the Isle of Wight.

Mr. Quibell exhibited *Pyrameis atalanta* ♀ with pale buff bands, interrupted with white on the forewings; *Gonepteryx rhamni* well margined with pale red along the outer two-thirds of costa of the forewings and the tips of the hindwing tails also red; several radiate forms of *R. phlaeas*, etc.

Mr. S. G. Castle-Russell exhibited some remarkable aberrations of British Lepidoptera bred or taken by him during 1933, including a beautiful *Breuthis euphrosyne* with much intensified and radiated black markings on the forewings, and hindwings largely covered by deep black with seven radiating bars of fulvous, the undersides being very light yellow with intensified and extended silver markings; an extreme radiated type of *B. selene* on both upper and undersides; other notable forms of the above two species; *Euchloë cardamines* with very pale lemon patches instead of the usual orange tips; *A. coridon* ♀, underside left wing normal, right wing very heavily striated; *A. thetis* (*bellargus*) ab. *pallida*; *Polyommatus icarus* with lower wings of a pale opalescent mauve shade; etc.

Mr. A. G. B. Russell exhibited a collection of Dorset rarities taken this year and last, including, *Leucania unipuncta*, *L. albipuncta* and *L. vitellina*; a coloured drawing of aberrations of *Aglais urticae* by F. W. Frohawk and another of *Lycaena arion* by the same.

Dr. E. Scott exhibited *Parnassius apollo* race *cavelius* and *Pararge maera*, the northern race, both from Finland; and a series of forms of *Rumicia phlaeas* from Ashford, Kent.

Mr. A. Simmonds exhibited fine series of Rhopalocera taken recently in Austria.

Mr. Hy. J. Turner exhibited examples of *Dianthoecia barrettii* from Cornwall and Ireland with ab. *ficklini*, and also the closely allied species *D. luteago* from the continent, with which it has erroneously been associated.

On behalf of Mr. A. J. Wightman, he exhibited a frame containing the wings of reputed *D. luteago* from specimens taken in Germany, Corsica, Amasia (*argillacea* form), Digne (*argillacea* form), Digne, with notes on the ancillary appendages, showing the *argillacea* form both from Amasia and Digne were a *barrettii* and not *luteago* form, having the short broad spine and not the long spine as in *luteago*.

Mr. S. Wakeley exhibited Lepidoptera he had taken or bred during the present year, including *Anaitis efformata* and *Coleophoraonosmella*, from Selsdon; *Aventia flexula*, a varied series of *Lithosia deplana* (*depressa*) and *Peronea cristana* from Box Hill; *Strymon pruni* and *Ruralis betulae* from Monk's Wood; *Catocala promissa*, *Cepphis adenaria*, and *Microstega pandalis* from the New Forest; a large number of species from the Isle of Wight including *Colias croceus* with f. *helice*; together with many species taken at the Society's Field Meetings of the year, of which *Cedestis gysseleniella* was the most notable.

Mr. H. G. Wells exhibited aberrations of *Polygonia c-album*, a *striata* form of *P. icarus* and other aberrations.

Mr. Clifford Wells exhibited various forms of British Lepidoptera.

Rev. G. Wheeler exhibited (1) a ♂ and ♀ of each of the broods of *Pieris brassicae* showing how greatly the third (unusual October) generation with its greenish und.s.h.w., differs from the two normal broods. (2) *Polyommatus amandus* from Finland including a ♀ much suffused with blue; *Brenthis selene* with a clay-coloured aberration of the ♀ and a very small form of the ♂ (ab. *selenia*); *B. aphirape* trans. to race *ossianus*; *Hesperia alveus* and ab. *serratulae-formis*, all being from Finland. (3) Series of *Brenthis arsilache* from N. Germany, S. Germany, Belgium, the Engadine, Central Norway and S. Finland.

Dr. Harold B. Williams exhibited *Heliothis armigera* from Folkestone; 3rd brood of *Lycanopsis argiolus*; *Hipparchia semele* ab. *anopenoptera*, entirely without eyespots, Hampshire 1933; yellow ♂ and brown ♀ of *Cosmotriche potatoria* from N. E. Surrey; *Agriades coridon* ab. *fowleri* and other forms from Folkestone.

Mr. H. Worsley Wood exhibited aberrations of *Mimas tiliae* and *Arctia caja*.

Mr. C. M. G. de Worms exhibited a large number of his captures and the results of his breeding during the past season including *Colias hyale* from Kent; *Hyloicus pinastri* taken and bred Dorset; *Stauropus fagi*, New Forest; *Agrotis vestigialis*, Studland; *Nonagria sparganii*, Kent; Lepidoptera taken at Aviemore and Struan including *Endromis versicolor*, *Aplecta tincta*, Taeniocampid species, and *Nyssia lapponaria*; and a series of rarities, local species and aberrations including *Apatura iris*, *Melitaea athalia*, *Lophopteryx carmelita*, *Acrionicta auricoma*, *Leucania albipuncta*, *Heliothis peltigera* bred from Kent, *Mellinia ocellaris* two taken in Suffolk, *Apocheima hispidaria* a melanic ♂, and a melanic ♀ of *Lycia hirtaria* from London.

Mr. N. G. Wykes exhibited (1) aberrations of *Agriades coridon*, *Amorpha populi* and forms of *Triphaena fimbria*. Framed coloured figures of various Lepidoptera including *Morpho menelaus*, *Papilio blumei*, *Apatura iris*, *Ornithoptera poseidon*, etc.

On behalf of Mr. G. Wynn a specimen of *E. cardamines* with the apical areas lemon-coloured was shown. It was taken at Buxted on June 10th.

Mr. S. R. Ashby exhibited British *Carabidae*, *Chrysomelidae* and *Lariidae* (*Bruchidae*) from his collection of Coleoptera.

Dr. K. G. Blair exhibited (1) Various Coleopterous larvae; (2) Living larvae of *Tiresias serra*; (3) The 4 species of the Longicorn genus *Monochamus* which occur occasionally in Britain, viz., *M. quadri-*

maculatus, *M. sartor*, *M. sutor*, and *N. galloprovincialis*; (4) and his captures in various orders at the 1933 Field Meetings.

Miss Winifred M. A. Brook exhibited numerous coloured sketches of British Fungi.

Mr. H. G. Denvil exhibited a living specimen of the four-lined snake (*Coluber quatuor-lineatus*) from the continent; larvae of *A. hyperantus*; varieties of *Arctia caja* and species taken at the various Field Meetings.

Mr. T. R. Eagles exhibited a selection of captures at the Society's Field Meetings including the Coleoptera *Demetrias imperialis* and *Malachius marginellus* from S. Benfleet and *Leptura* (*Strangalia*) *quadrifasciata* from Byfleet.

Mr. S. W. Jarvis exhibited a large number of exotic Longicorn beetles.

Mr. A. M. Low exhibited the Diptera, ♂ and ♀ *Xanthogramma citrofasciatus*; ♂ *Volucella inanis*; series of *V. inflata* from Brockenhurst; series of 4 species of *Helophilus* from Middlesex; ♂ *Chrysotoxum elegans*; ♀ *Stratiomys patamida*; series of *S. furcata* from Ireland, Co. Sligo; and 2 ♂ *Tabanus fulva*.

Mr. Hugh Main exhibited larvae of the Glow-worm, young trap-door spiders, and the bird-eating spider.

Mr. M. Niblett exhibited numerous gall-causing insects from the families Cynipidae, Tenthredinidae, Aphididae, Psyllidae, Trypetidae, and Cecidomyiidae.

There were other exhibitors but no details of their contribution to the evening's show reached the Secretary. Fortunately extra tables were available on this occasion, or the "reservists" might have caused congestion of the exhibits. As it was, there was great difficulty in seeing some of the Lepidoptera as the exhibitors of British Macrolepidoptera crowded their exhibits on one long table, around which during most of the evening there was considerable congestion. It is suggested that on future occasions shorter benches be the rule and that the British Lepidoptera be more scattered in the room.—HY. J. T.

***Cis quadridentulus*, Perris (Cissidae, Col.) a species of Coleoptera new to Britain.**

By HORACE DONISTHORPE, F.Z.S., F.R.E.S., etc.

"*Cis quadridentulus*, Perris.—Long. 1.3 mill., Roux, convexe, peu brillant, assez allongé; pubescence très-courte. Tête finement ponctuée, rugueuse. Corslet convexe, fortement rétréci en avant, tous les angles arrondis; côtes un peu arrondis, nullement explanés; ponctué assez fortement et assez dru. Elytres allongées, convexes, un peu déprimées à la suture, ponctuées un peu plus finement que le corselet. Mâle ayant sur la tête quatre tubercules spinuliformes, et sur le premier segment ventral une petite fossette pilifère. Landes." *Ann. Soc. Ent. France* (S.5) 4 LIII. (1874).

On June 27th, 1933, a specimen of this little species was taken in a small bit of the "Dryad" fungus inside a hollow beech in Windsor Forest. Other years a large quantity of this fungus has occurred in this tree (in which we discovered *Dorcatoma serra*, Pz., in 1928);

but this year, possibly on account of the drought, it occurred very sparingly.

This little species is quite unlike any of our others. We have been unable to get a continental specimen to compare it with, but as it agrees well with the original description, and does not fit in with any other species in the tables, it seems best to record it as *quadridentulus*, rather than describe it as a new species. Unfortunately our single specimen is a female.

It perhaps comes nearest to *Cis fuscatus*, Mel., from which it differs in being smaller, narrower, much less strongly and more closely punctured, more shining (the spaces between the punctures being quite dull in *fuscatus*), the thorax more narrowed in front, the border to the thorax much narrower and hardly visible (not at all in front) when viewed from above, and the very short pubescence (little bristles) is more sparse, and finer (thinner) individually.

It is evidently very rare on the Continent, but has been recorded from France and East Prussia.

Mermithogynes.

By J. NEUFVILLE TAYLOR.

On August 9th, 1931, I happened to open a colony of *Acanthomyops flavus* (F.) in which the virgin queens were parasitised by Nematode worms. I took twelve of these Mermithogynes. I did not observe any normal-winged females. There were present in the nest many males and workers, but I did not notice any of these to be parasitised.

This nest is situated on the left bank of a small millrace on the borders of Hampshire and Sussex. It is about 18 inches above high water mark and 2 ft. from the water's edge, but it is in a dry situation, and is, so far as I can ascertain, never flooded.

I was unable to visit this nest again until July 25th of this year. The following is an account of my observations made on my second visit.

On reopening the nest I captured 44 Mermithogynes (parasitised ♀s) and 13 Mermithaners (parasitised ♂s). I also took 5 normal-winged females. There were present in the nest many normal males and many workers.

Mr. Donisthorpe tells me that Nematode worms are not known to affect workers in this country.

I found also, in the nest, one specimen of the White Woodlouse (*Platyarthus hoffmanseggi*), which is a regular inhabitant of most ants' nests. No grubs or pupae were present. I saw the Queen-mother and several batches of eggs, but I did not touch them for obvious reasons; for I am hoping the nest will survive and supply me with further material.

The mill stream forms the boundary of a garden and I found no nests of *A. flavus*, other than the affected one in the garden within a radius of about 30 yds. However within three feet of the affected colony was a nest of *A. niger* on the same side of the stream, but in this I could not find any signs of the presence of Nematodes.

I examined most carefully the other bank of the stream for a radius of about 20-30 yds. from the affected nest, but although there were

many colonies of *A. flavus* (none of *A. niger*) they all appeared unaffected by Nematodes.

Possible explanations of the fact that the Nematodes do not appear to have spread to the surrounding nests may be as follows:—

- (a) The nearest nest of the same species is too far away (about 8 ft. across the stream.)
- (b) Although the species *A. niger* is known to be parasitised by nematodes in this country (cf. Donisthorpe, *The Guests of British Ants*, p. 218, et seq.) they may, quite possibly, act as host to a separate species of nematode.

Mermithogynes are easily recognised by two facts, the shortness of their wingspread compared with normal females, and the extremely distended condition of their gasters (due to the presence of the parasites). The average wingspread of the normal females from this colony is about 19mm. That of the Mermithogynes from this colony ranges from 10 to 11.5mm., with an average of about 11mm.

Mermithaners are not so easy to detect, as the wingspread of the specimens from this nest is only about 1mm. less than normal. They are, however, distinguishable from normal males by their distended gasters and the consequent protrusion of the copulatory organs.

I placed some well-moistened soil from the affected nest in a tin and placed 7 living Mermithogynes on it. Within 15 mins. the worms had made their exit from four of the ants. The worms did not come out of the remaining three ants for about four days.

In all cases the worms left the ants through the anal orifice, and in two cases out of the seven, two worms made their exit simultaneously. The ants were extremely restless while the worms were coming out, walking round and round the tin all the while and continuing for some time afterwards. After the exit of the worms the gasters of the ants then shrunk to less than normal, as would be expected. In all seven cases the ants were dead within 24 hours after the exit of the worms.

Immediately after leaving their hosts the worms burrowed into the moist soil and at the time of writing are lying coiled together apparently in a dormant state, in the soil. However, when disturbed they may be seen reburying themselves. I have at least 9 living worms from seven ants.

When the nematodes are dissected from the gasters of the ants, there is found to be very little trace of internal organs such as stomach, crop, ovaries, etc. in the ants. The worms probably develop in some part of the alimentary canal, but this is very difficult to prove by dissection owing to the gross distortion of the internal organs. The worms, however, lie neatly coiled together and tightly packed within the gaster, occupying all the available space.

On dissecting four Mermithogynes, the number of worms in each was as follows: 4 : 4 : 4 : 2. Next I dissected a specimen which contained only one worm which measured 35.4mm. in length. The maximum and minimum lengths for the worms dissected out were 35.4mm. and 15mm. with an average of about 23mm. No importance can be attached to these figures, since the worms were dissected out from the ants, and consequently may be, very probably, at different stages.

I noticed, however, that the worms which made their exit from the

living Mermithogynes were by no means of the same length, varying very considerably in length and diameter.

The movements of the worms are slow and deliberate. When examined under a high powered microscope (534 diameters) no internal organs are discernable. The main structure other than the skin, seems to be composed of a conglomeration of large roughly circular particles. In some cases longitudinal striae are visible but these are most variable, and in some cases do not appear at all. It must be remembered that these remarks apply only to the immature worms.

I shall attempt to infect one of my observation colonies with the worms.

I have given three Mermithaners to the British Museum, through Mr. Donisthorpe, to be incorporated in the collections.

NOTES ON COLLECTING, etc.

DENOPS ALBOFASCIATUS, CHARP. (CLERIDAE, COL.) CAPTURED IN BRITAIN.—On August 26th last Miss Irene Kirk saw a beetle running rapidly on the window sill in my study in Putney, and put it under a glass. When I saw it I at once recognized the fact that it was new to our fauna and so we made it out from Reitter's *Fauna Germanica* to be *Denops albofasciatus*, Charp.

Abroad this pretty little beetle is found in France, Germany, South Europe, Sicily, the Caucasus, and Algeria. It occurs in the burrows of *Xylomytes retusus*, Ol. (*Anobiidae*, Col.) in old vines; a genus not found with us.

It is possibly, however, parasitic on other wood borers, and may have come from one of the following sources:—a year or so ago *Lyctus brunneus*, Steph. (*Lyctidae*, Col.) was rather common, breeding in a dressing table, in the room which is now my study; and *Anobium striatum*, Ol., is abundant in the wood work of the stairs and its roof, leading down to the cellar. On the other hand there are many oak logs in the cellar from Windsor Forest; there are many sticks in the garden we have brought up from Windsor Forest; and the fence on one side of the garden consists of oak panelling from Windsor Great Park. Both *Lyctus linearis*, Goez., and *L. brunneus*, Steph., occur in oak fences in Windsor Forest, and Park.

Stephens recorded *Tillus unifasciatus*, F., which is a nearly allied species to *D. albofasciatus*, Charp., and is parasitic on *Lyctus brunneus*, Steph., as having been taken not infrequently near Windsor. If it is an introduced species, how it got into my room is a mystery. Personally I am inclined to favour its Windsor origin; but as no more specimens were taken the matter must be left in doubt.—HORACE DONISTHORPE, Natural History Museum. 4.xi.33.

POLYGONIA C-ALBUM, ABERRATION.—On August 25th near Hassocks in Sussex I took a specimen of *P. c-album* with white oval rings on its under wings, instead of the normal C. Has this variety been named and is it unusual?—H. A. BUCKLER, St. John's Road, Leicester, 1.xii.33.

CACOECEIA PRONUBANA, HB.—This little Tortricid seems to be extending its range in the South of England, and exact records of its spread

would be interesting. In Meyrick's *Revised Handbook* (1928) its distribution is given as Sussex and Devon. On June 27th, 1930, I took a specimen flying in the morning sunshine in Queen's Gate, London, S.W., within sight of the Natural History Museum; possibly this may have been imported in the larval stage, but it seems not improbable that it may be found breeding on *Euonymus* in the London area. Recently Mr. A. M. Massee has informed me that this species occurs in the Maidstone District, Kent. Its foodplant is generally given as *Euonymus*, but the larva is very polyphagous, and at Hyères I found it feeding commonly on ivy, between spun-together leaves.—T. BAINBRIGGE FLETCHER, Rodborough. 19.xi.1933.

IMMIGRANT LEPIDOPTERA AT STROUD IN 1933.—*Vanessa atalanta*, L., arrived here on 21st May, when two, not quite fresh, were seen in the garden. On 29th May a new arrival, an individual with the left h.w. chipped, was noticed, and several specimens were about during June and July, the last of the immigrants, very worn, being noted on 21st July; the English brood commenced to emerge from 28th July and was common in August and September, the last seen on the wing on 12th October.

Vanessa cardui, L. Four individuals, all very worn immigrants, suddenly appeared at 7 p.m. (Summer-time) on 20th May and one or two other worn examples were seen on 21st May. Several of these immigrants were noted on various dates between 26th May and 14th June, the first specimen of the English brood was found on 19th July and the species was fairly common henceforward until 29th September.

Colias croceus, Fourc. One, apparently a male, was seen on the wing on 2nd August and a worn male was taken on 4th September.

Macroglossum stellatarum, L. The first immigrant was seen on 4th June, three more on 5th June and another on 10th June. The first fresh specimen was taken on 5th August and the species was common during August and early September, the last being noted on 11th September.

Plusia gamma, L. Worn immigrants appeared on 30th May and others from 3rd June and 21 June. Fresh examples occurred from 26th July. Probably there were two broods, as fresh specimens were about during August and up to 5th September and one fresh example was taken at light as late as 23rd October. On 26th August one came to sugar, rather an unusual habit (but recorded previously) for this species.

Nomophila noctuella, Schiff. A single fresh specimen was taken at Ashted (Surrey) as early as 8th May. At Stroud a few worn immigrants were noted on 4th and 5th June, and others of the local brood were taken on 4th August, 28th August, 4th September up to 26th September, but this species only occurred here in comparatively small numbers this year.—T. BAINBRIGGE FLETCHER. 19.xi.1933.

AN AUSTRALIAN TORTRICID (*TORTRIX POSTVITTANA*, WALKER) IN ENGLAND.—Amongst a number of Tortricina, reared from apple and sent for identification by Mr. A. M. Massee, of the East Malling Research Institute, Kent, was a female specimen of *Tortrix postvittana*, Wlk., which was reared on 1st June, 1933, from a larva found on May 23rd in a Cox's Orange Pippin apple which had been imported from

New Zealand a few weeks earlier. Three living larvae were found in three fruits of this lot but of these two died and only one was reared out.

Tortrix postvittana is a well-known pest of apple orchards in Australia, where it occurs from Queensland to South Australia, and also in Tasmania. About forty years ago apparently it was carried to New Zealand, where it has made itself thoroughly at home, and it is also known from New Caledonia and the Hawaiian Islands. The larva does not confine its attentions to apple but has been recorded from *Correa speciosa*, *Boronia ledifolia*, *Persoonia lanceolata*, *Grevillea robusta*, *Polygonum* sp., *Euphorbia*, *Acacia koa*, *Citrus* and *Pelargonium*.

Should it be introduced into the South of England in Australian or New Zealand apples in numbers sufficient to be able to breed in England, it should be quite capable of acclimatizing itself here and might become an established pest of apple in this country also.—T. BAINBRIGGE FLETCHER, Rodborough. 19.xi.1933.

ABUNDANCE OF PYRAMEIS ATALANTA NEAR COVENTRY.—In September I was struck by the large quantity of *P. atalanta*. One morning I counted about 80 frequenting old sugaring patches, nine on one patch being common. I also saw three *Polygonia c-album* on the same sugar patches.—J. W. SAUNT (A.L.S.)

CURRENT NOTES AND SHORT NOTICES.

Our correspondent Mr. B. J. Lempke of Amsterdam, has sent us a copy of his comprehensive article on the variation of *Colias croceus*, Fourcr. in which he accepts the conclusion arrived at by a few more recent workers, that *croceus* is really a subsp. of the *Colias electo*, L. After dealing at length with the Biology, he passes to the Morphology and discusses some 30 named forms two of which are new forms described by him, viz. (1) ab. ♀ *basisuffusa*, orange ♀ with strongly suffused base of wings; (2) *rufo-maculata* "The double silver spot wholly suffused with carmine red." *Ent. Berichten*, no. 185, p. 381 (1932).

The current annual volume of the *Ann. Nat.-Hist. Mus. in Wien* contains several entomological items. (1) "Lepidoptera from Angora" by the veteran H. Rebel; (2) "New or little known Oriental *Tenthredinidae*" by R. Forsius; (3) "Palaeartic *Chironomidae* in the Museum of Vienna" by Dr. M. Goetghebuer; (4) "Three European *Simulium* (Dip.)" by F. W. Edwards; (5) "*Apidae* collected by Dr. Zerny in his Amazon Expedition" by J. D. Alfken. These papers are well illustrated.

The *Boll. Lab. Zool. Gen. e Agr.* of Portici (Ital.) is again a useful record of excellent work in the investigation of the Biology of insects that are detrimental to agricultural interests and to human existence. Twelve special memoirs, six by the world-famed Prof. Silvestri, profusely illustrated, deal with subjects affecting all parts of the world, mainly insects of the more obscure and little known orders, and therefore the more needing thorough treatment.

The *Bull. Roy. d'Hist. Nat. à Sophia*, Vol. VI. 1933 contains articles on New *Carabidae* for Bulgaria, the "*Histeridae* of Bulgaria," and part II. of a "Catalogue of the *Buprestidae* of Bulgaria," all three

dealing with Coleoptera. There is another article on the "Parasitic Flies of the Family *Oestridae* in Bulgaria."

The current *Ann. Soc. Ent. de France*, Vol. CII., pt. 3, is a continuation of the "Cat. des Pyrénées" by M. J.-P. Rondou, carrying on from the *Lasiocampidae* to nearly the completion of the *Noctuidae*.

The *Verh. Zool.-Bot. Gesell. Wien.* pt. 1-2 for 1933 contains an account of the *Adephaga* (Col.) of the Eastern half of the Eastern Alps from Salzburg to South of Vienna and reaching south of Klagenfurt with the Steiner-, Kor-, and Sau-Alpes. A diagrammatic map and an index of genera concludes the 164 pp.

The *Bull. Soc. Lépid. de Genève* for 1933 just received is an interesting number. There is a striking portrait of the late Prof. Vorbrödt. M. Gallay describes with 3 photographic illustrations an apparatus he has devised for Microphotography. The President gives an account of a species, *Xanthospilapteryx loriolella*, closely allied to our *X. syringella*, and gives figures of both species. A coloured plate of the larvae of two Brazilian Lycaenids which M. Romieux describes. A map illustrates the distribution of *Erebia* (*Maniola*) *glacialis* in the Swiss National Park, which extends East of Tarasp and South-east of Zernetz, showing the separate distribution of the race *alecto*.

The first two portions of Dr. Zerny's *Lepidoptera from the Northern Lebanon* have just appeared separately and deal with (1) the Rhopalocera, 90 species and (2) Bombyces, etc., Noctuae and Geometers, 260 species, with a plate of 40 figures. There are a considerable number of new species and forms among the Heterocera as might have been expected in an area not previously worked for other than Rhopalocera. Most of the new items are figured.

We quote the following distribution of the two closely allied *Melitaea*, *M. athalia* and *M. pseudathalia* from the *Int. Ent. Zeit.* of July last.

M. athalia:—North and mid. France, England, Belgium, Norway, Germany, Austria, S. Tyrol, Croatia, Kärntäl, Adriatic Coast, Russia, Georgia, Armenia, Amur district, Japan.

M. pseudathalia:—S. France, Pyrenees, Mouth of the Rhone; Var, Basses-Alpes, Canton, Geneva, C. Waadt, C. Wallis, C. Bern, C. Uri, C. Tessin, North, Mid. and South Italy, Spain.

Perhaps some of our readers, who have tested the ancillary appendages, can add or modify this from their own experience and knowledge.

This abnormal season second and third broods seem to have been in evidence a good deal in reports and converse. It would be interesting to get a collected record of all such occurrences. And if our readers would collect records and send them on to us at Cheam a very useful summary could be made. Many species were noted more than a month before the normal date for their first appearance and this date if known might also be included in the record of the year.

Will all please help. May I at the same time thank all those who responded so well to the request for records of immigrant species.

REVIEWS AND NOTICES OF BOOKS.

RECENT PUBLICATIONS OF THE INDIAN FOREST DEPARTMENT.—The activities of the Forest Entomologist, stationed at Dehra Dun, India, in investigating and controlling the Insect Pests, which damage trees

throughout the quarter of a million square miles of the afforested areas of India, are all two little known and appreciated, but a batch of recent (1933) publications of the Entomological Series of the *Indian Forest Records* gives some slight insight into the excellent work that is being done under Dr. C. F. C. Beeson, the Forest Entomologist. In Southern India the Sandal-wood Tree (*Santalum album*), a valuable forest product, is subject to a die-back disease called "Spike," whose causation has always been something of a mystery. Of late years it has been supposed that this disease may be of the nature of a virus-disease spread by Insects and, with a view to determine the insect or insects concerned in its transmission, an investigation of the Insect Fauna of Sandal was commenced in 1930, to discover all the insects associated with the growing Sandal throughout the year. The first step being the collection and observation in the field of all such insects, the next was to identify these and, as is only to be expected in a country such as India where only a fraction of the Insect Fauna is yet known, a large proportion of the species has proved to be new, requiring to be worked out and described by specialists in the various groups. The *Bostrychidae*, *Platypodidae* and *Scolytidae* have been dealt with by Dr. Beeson (Vol. XVII., Part 9, pp. 7-12, 1 fig.; 5d.); the *Membracidae* by W. D. Funkhouser (Vol. XVII., Part 10, pp. 1-10, Tab. 1; 8d.); the *Cercopidae* by Dr. V. Lallemand (Vol. XVIII. Part 1, pp. 1-4; 3d.); the *Brethidae* and *Lycidae* by R. Kleine (Vol. XVIII. Part 2, pp. 1-4; 3d.); the *Anthribidae* by Dr. Karl Jordan (Vol. XVIII. Part 3, pp. 1-8; 4d.); the genus *Exocentrus* (*Cerambycidae*) by W. S. Fisher (Vol. XVIII. Part 4, pp. 1-5; 3d.); the Neuroptera by Dr. Nathan Banks (Vol. XVIII. Part 6, pp. 1-4; 3d.); and the *Melasidae* and *Elateridae* by E. Fleutiaux (Vol. XVIII. Part 7, pp. 1-16; 6d.).

Mr. J. C. M. Gardner, Systematic Entomologist at the Forest Research Institute, has also been continuing his very valuable papers on the immature stages of Indian Coleoptera, of which the 13th Part (*Indian Forest Records, Entom. Series*, Vol. XVIII. Part 9, pp. 1-19, tt. 1-4; price 1s. 9d.), now before us, deals with the larvae of various *Bostrychidae*, whilst in the 12th part (Vol. XVII., Part 8, pp. 1-12, tt. 1-2; price 1/-) Mr. Gardner describes the larvae and pupae of certain *Carabidae*, and points out that the length of the frontal plate varies but little for a given larval stage of a species and hence is of taxonomic value and that this length increases by geometrical progression from stage to stage, although the growth factor is not necessarily the same for all species.

Mr. W. S. Fisher, of the U.S.A. Bureau of Entomology, also describes several new Indian *Cerambycidae* from the Dehra Dun Collection (*l.c.* Part 6, pp. 1-8; 3d.).—T. BAINBRIGGE FLETCHER.

THE SUPPLEMENT TO SEITZ PALAEARCTIC MACROLEPIDOPTERA.—Parts 43 and 44 of the *Supplement to Seitz Palaearctic Macrolepidoptera* are now to hand. They consist of 32 pages and 2 plates. A short conclusion to the *Psychidae* dealt with in the last part is succeeded by a consideration of the new forms of species in the families *Thyrididae*, *Aegeriidae*, *Cossidae* and *Hepialidae*. The species which occur in Gt. Britain are *Sphecia crabroniformis* with two new forms, *Paranthrene tabaniformis* with 3 new forms, *Synanthedon flaviventris* with 1 form, *S. vespiformis* with 1, *S. myopaeformis* with 1, *Dipsosphecia*

ichneumoniformis with 2, and *Chamaesphecia chrysidiformis* with 5, in the *Aegeriidae*. In the *Cossidae* there are *Cossus ligniperda* (*cossus*) with 4 new forms and a consideration of some other forms, *Zeuzera pyrina* with 3, and *Phragmataecia castaneae* with 2. The British *Hepialidae* noted are *Hepialus hecta* with 3, *H. humuli* with 1, and *H. sylvinus* with 2. In addition there are 8 pages of *Addenda* to the *Supplement* dealing with the very extensive material which has come to hand since 1930 regarding the *Zygaenidae*, which will be continued in a forthcoming part. The Irish and Swiss forms of *Zygaena purpuralis* are considered as well as the Scotch form of *Z. achilleae*. All the necessary references are supplied so that tracing matters is an easy task. The two plates contain nearly 200 figures of the forms dealt with.—Hy.J.T.

Two parts of *Seitz Main Volumes*, 554 and 555 are just published, and deal with the Geometers of the *African Fauna*: Vol. XVI., consisting of 24 pages with 3 plates. For the letter-press Mr. L. B. Prout is responsible and one may be assured the best is made of the available material; much that was new was brought by Barnes and others under the auspices of the late J. J. Joicey. The huge genus *Scopula* will no doubt be further analysed when the life-histories become known. Another big genus is *Sterrhia* (*Ptychopoda*). Then comes *Rhodometra* among which one finds *R. sacraria* a rare visitor to Britain. The *Larentiidae* are commenced of which the genera *Eois*, *Xanthorhoe*, *Ortholitha* and *Larentia* occur. The 3 plates contain a very large number of figures which enable one to compare our familiar British species with the species in other parts of the world allotted to the same genus. We note one British species *Nycterosea* (*Orthonama*) *obstipata* (*fluviala*) of which a local race or subspecies is found in Natal.—Hy.J.T.

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SPECIAL INDEX.

By HY. J. TURNER, F.R.E.S., F.R.H.S.

VOL. XLV. (new series) (1933.)

The Entomologist's Record & Journal of Variation.

Coleoptera arranged in order of Genera. The other orders arranged by Species. Genera, Species, etc., new to Britain are marked with an asterisk, those new to Science with two asterisks.

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The description in Haworth of *oblonga* is "Alis cinereis nebulosis, costa maculâquae oblongâ fuscis, strigâque albâ posticâ undulatissimâ."

"Alae anticae, longitudinaliter semifuscae, in quâ parte puncta costalia, apex, et stigmata ordinaria, cinerascientia. Altera pars alae etiam cinerascit, maculâ majusculâ posticâ cuneiformi fuscâ, et aliâ in medio oblongâ marginem tenuiorem versus." Based on 1 example only.

I cannot reconcile this description with our species; in which the only white I have ever seen is the sometimes present white colon dots as in *albicolon*. Stephens omits reference to *oblonga* as does Wood.

Tutt, *Ent.* XXII. 209 (1889): *Brit. Noct.* I. 109 (1891): Smith, *Cat. Noct. N. Am.* 136 (1895): Barrett, *Lep. Brit. Is.* IV. 348, plt. 175 (1897): Stdgr., *Cat.* IIIed. 173 (1901): Splr., *Schm. Eur.* I. 198, plt. 40 (1905): South, *Moths Br. Is.* I. 270, plt. 131 (1907): Hamp. *Lep. Phal.* VII. 208, 446, plt. 119 (1908): Warr.-Stz., *Pal. Noct.* III. 167, plt. 40b. (1911): Culot, *N. et G.* I(1). 159, plt. 29 (1909-13).

Freyer's figure, *l.c.* plt. 149, 1, named *nigricans* is greyish-black with indistinct markings and in reference to Hübner's fig. 539 he says that is too bright, the ground colour should be darker brown.

Freyer's figure, *l.c.* plt. 311, 1, named *abjecta*, is slightly red-brown not comparable to the rich colour of Hübner's 539. Gn. says Freyer's fig. 311, 1, is the *fribolus*, Bdv., *l.c.* plt. 84, f. 4.

He says that since there are at least two other *nigricans* and some doubt has been expressed as to *nigricans*, View., being *abjecta*, Hb. that it is better to call his figure 311 by Hübner's name *abjecta* as it represents the same species. He also says Hübner's figure 539 is not good.

Guenée *Noct.* I. 193, accepts the decision that *abjecta*, Hb. is *nigricans*, View. and also that the *lunulina*, Haw. is the same species.

H.S., *Sys. Bearb.* II. 270, said that the figure is too light and too yellow, the waved line too sharp, the reniform is frequently not so white. He said that Freyer's fig. 311 is not more recognisable than that of Hüb., the markings much too distinct especially the waved line too coherent. The fig. 631 H.-S. is rather too large and the marking rather obtrusive, with a brown shade in places interspersed with blackish and greyish shading, the transverse lines and stigmata pale, especially the waved line.

Stgr., *Cat.* IIIed. 173 (1901), says of the *abjecta* form "forma al. ant. fere unicolor nigris," which is certainly not a short description of *abjecta*, Hb., but may represent the black N. Kent form, which Tutt named *nigro-distincta*.

South, *M.Br.l.* I. plt. 131, has two very good figures, 5 *unicolor*, 6 what one takes to represent *lunulina*, Haw., or *oblonga*, Haw.

Spuler, *Schm. Eur.* I. plt. 40. f. 13, is a very good figure but there is not grey enough in it. The brown is too emphasised by the method of plate production.

Warr.-Seitz gives seven figures, *l.c.* plt. 40b: *abjecta*, Hb. which has not the ground colour of fig. 539 Hb. which is dominantly red, while this is a medium brown neither red nor ochreous: *oblonga* ♂ and ♀ which are both very varied brown with distinct dark and light markings: *lunulina* a darker brown with distinct markings: *fribolus* a decided black brown with very obscure markings except the stigmata which are outlined in black, with a colon mark: *unicolor* ♂ and ♀ of

an almost uniform grey brown, deeper in the male, which certainly does not reproduce the colour of our Thames estuary *unicolor* which it is intended to do and is not "grey brown."

I cannot understand Warr.-Seitz saying that the figure 539 *abjecta*, Hb. is grey brown when it is a rich brown and no trace of grey in it.

Culot *N. et G.* I(1), plt. 29, figs. 4, 5, has figured in 4 our *unicolor* form fairly well but hardly grey enough. Fig. 5 he calls ab. *fribolus* of which it is a very good representation.

Of the Variation Barrett says—"In our most frequent form the markings are barely perceptible, nearly unicolorous shining dark smoky-brown or brown-black; yet in almost every example some of the markings exist, the whitish dots of the reniform stigma and the subterminal line being the most constant, and the rest showing themselves in ever varying degrees."

Barrett records specimens "of a paler ground colour in which the markings are thrown into far greater distinctness."

Another specimen he describes as "very strongly blotched with three long pale stripes lengthwise, partly obliterating the usual markings."

He records another in which "the orbicular and reniform stigmata are both yellowish-white; the ground colour almost pale grey with distinct black blotches, one near the base of the dorsal margin, one larger, near the middle of the wing, uniting the first and second lines, and several along the subterminal line, these last very velvety."

List of Forms and Names to be considered.—

nigricans, View. (1789) *Tab. Verz.* II. 66.

(ab.) *abjecta*, Hb. (1818) *Saml. Noct.* 539; Warr.-Seitz *Pal. Noct.* plt. 40b.

ab. *oblonga*, Haw. (1809) *Lep. Brit.* 188; Warr.-Stz. *l.c.* plt. 40b.

ab. *lunulina*, Haw. (1809) *l.c.* 192; Warr.-Stz. *l.c.* plt. 40b.

subsp. *devastator* (*triv.*), Brace (1819) *Am. Jr. Sci.* 184.

ab. *fribolus*, Bdv. (1832) *Icones*, plt. 84, 3; Warr.-Stz. *l.c.* plt. 40b.

ab. *variegata*, Stdgr. (1871) *Cat.* IIed. 101.

subsp. *nigro-distincta*, Tutt (1889) *Ent.* XXII. 209.

ab. *unicolor*, Tutt (1889) *l.c.*

Tutt deals with (1) *abjecta*, brownish grey with distinct markings. (2) *variegata* blackish grey varied with small amount of black and white markings. (3) *unicolor* brownish grey, with slight ochreous tinge, no distinct markings, with appearance of indefinite irroration. (4) *fribolus* greyish black with indistinct markings. (5) *nigro-distincta* blackish grey, with distinct markings. (6) *lunulina* which Tutt says "agrees pretty correctly with *abjecta*, Hb."

Hüb., *Saml.* Text 188 (1805-18) says that his *abjecta* is the *nigricans* of Vieweg.

ORIG. DESCIP.—"Blackish coloured: the wings marked with palish stigmata and waved lines, and also bestrewn as it were with black streaks and atoms between: the lower wings brownish white shaded blackish grey: the abdomen a similar grey." Brandenburg.

This is a very inadequate and incorrect description of the figure.

Newman remarks, "This obscurely marked insect is the *lunulina*, Haw. (*Lep. Brit.* 192)." His, Newman's, figure is not too obscure.

But Tutt, *B.N.* II. 110, writes that *lunulina*, Haw. "agrees pretty correctly with Hübner's type." This I am unable to agree with since Haworth's *lunulina* is described as "Alae fuscae, vix cinerascens strigis quatuor obsoletis pallidioribus nigro adnatis, quasi ex lunulis minutis: prima basi fere omnino oblitterata, secunda undate ante, tertia arcuata pone medium; inter has lunulâ punctisque aliquot pallidis loco marginis stigmatis postici. Stigma anticum deest. Tunc striga quarta dentata," which surely does not describe Hübner's fig. 539 but does describe our "obscurely marked" insect ordinarily known as *abjecta*, the British form. It is based on one specimen only.

Stephens, *Ill.* II. 130, translates Haworth's descriptions of *lunulina* but does not comment on it. He places it in *Graphiphora* near *pyrophila* and *augur*.

Hübner's fig. 539 is certainly not "obscurely marked," and I have not seen a specimen nor any other figure of the almost "reddish grey" of Hübner's fig. It is a very extreme varietal form.

Staudinger's *variegata* is an Asia Minor form. Warr.-Seitz says it must be very nearly the same as the *oblonga*, Haw. form they have figured.

Guenée describes, but does not name, under *abjecta* B., a grey black form from the Eastern United States, New York and Canada. Tutt remarks on this that his form *nigro-distincta* from Greenwich and Cliffe (Kent) is one and the same. But Smith in his *Cat. Noct. N.A.* 136 (1893) identifies Guenée's B as the *devastator* (*trix*), Brace. (1819) = *ordinaria*, Wlk. (1878) = *contenta*, Walk. (1882), and *marshallana*, Westw. (1882). This is figured by Holland, *Moth Bk.* plt. XIX. f. 44 poorly, but recognisable as a brownish grey insect with very obscure darker markings except the lighter dots on costa and white remnants around the stigmata of some forms of *abjecta*. It is also figured by Warr.-Seitz *Am. Noct.* Vol. XI. plt. 34e and is the brown form not the grey-black of Tutt's form *nigro-distincta*. Hampson, *Lep. Phal.* VII. 446, has altered the spelling to *devastatrix*, he identifies it with *abjecta* B., Hb. of Gn. and figures it on plt. 119, f. 2.

Mamestra, Ochs. and Tr. (1816-1825), Hb. (1822) Ent. List., Tutt, Pierce, [*Hadena*, Schrnk. (1802) Stögr., Meyr.: *Polia*, Ochs. and Tr. (1816-25) H.-S.: *Trachea*, Ochs. and Tr. (1816-25) Hamps.: *Brotis*, Hb. (1822): *Hama*, Steph. (1829) South: *Neuria*, Gn. (1841-52) Dup. (1844): *Parastictis*, Hb. (1822)] *sordida*, Bork. (1792).

Borkhausen, *Naturg.* IV. 500, gives references to Schiff., Goeze and Jung for *sordida*. (1) Schiff. *Sys. Verz.* 81 (1775) no 17, Descrip.— "The earth-coloured, dull marked noctua." Larva unknown. A totally unrecognisable description (2) Göze, *Ent. Beitr.* III(3) 216 and (3) Jung, *Verz.* 135 are merely copies.

Borkhausen had identified his insect with the *w-latinum*, Rott. *Naturforsch.*, but one finds on comparison of the present insect with Rottemberg's description that they do not agree.

Tutt, *B.N. I.* 111. gave p. 239 for Borkhausen's reference instead of p. 578.

The names *sordida* and *anceps* were introduced by Schiff. in the *Verz.* p. 81. (1775) but since from the imperfect and meagre descriptions it was impossible to identify the insects intended, particularly as in the Schiff. collection there were forms of *segetum* and *corticea* under these names, Ochs. in 1816 named a species he had recently met with unnamed and thought it might be one of these forms of the *Verz.*, as *infesta*. Thus the doubt was partially allayed. Treit. in 1825, *Schm.* V(1) 146 placed *sordida*, Schiff. conjecturally under *ruris*, and on p. 305 he put *anceps*, Schiff. as either *perplexa* or *carpophaga*. However when he, Treit. came to the as yet undescribed *infesta* of Ochs. in *l.c.* V(2) 113, he described it fully as including both *sordida*, Bork., and *anceps*, Hb.

Werneb., *Beitr.* I. 419, 516, places the *sordida*, Schiff. with *infesta*, Tr. on the ground that the stigmata are very indistinct in the latter but always clear in *ruris*, but he decides the identification with doubt.

On the same page (81) Schiff. describes *anceps* as the "honey-brown noctua with white veins," larva unknown. This Werneb. *l.c.* does not identify.

The references to Schiffermüller in the *Verz.* 1775 must be ignored.

Tutt, *Ent.* 230 (1889) : *Br. Noct.* I. 111 (1891) : Barr., *Lep. Br. Is.* IV. 349. plt. 175 (1897) : *Stdgr. Cat.* III ed. 172 (1901) : *Spir. Schm.* *Eur.* I. 192. plt. 40. 18 (1905) : South, *Moths. Br. Is.* I. 271. plt. 131. 1-2 (1907) : Hamps. *Lep. Phal.* VII. 207 (1908) : Warr.-Seitz, *Pal. Noct.* III. 167. plt. 40a (1911) : Culot, *N. et G.* I(1). 155. plt. 28. 8 (1909-13).

Ernst and Engr., *Pap. d' Eur.*, VII. 107. figs 484 a.-b. have 2 of the best of the old figures (1790).

Hübner's fig. 484, *anceps* has the submarginal band too definitely a band compared with my series of 40. The large mottling of the forewing is too definitely irregular, and the hindwing submarginal suffusion is intersected by two narrow light bands neither of which in my series are so conspicuously developed, although they can be traced in most examples ; one would say they were obsolescent.

The fig. of Dup., *Hist. Nat.* VII(1). plt. 107. 5 (1827), *anceps* is in no way recognisable as the *anceps*, Hb. 484, either in colour or marking, but the fig. of *aliena*, plt. 102. 6 has much more the appearance of the *anceps*, Hb. form of *sordida*.

H.-S., *Sys. Bearb.* II. 273 (1845) says of Hb. fig. 484 *anceps*, that it is not good, the colour too clearly cut, the h.w. with the bands too distinct. It is the *aliena* of Dup. plt. 102.

Spuler, *Schm. Eur.* I. 192, plt. 40, fig. 18, is a very fair portrait of the banded form *mediana*, Warr.-S.

South's figures are moderately sufficient *M.B.Is.* I. plt. 131.

Warr.-S. fig. plt. 39h is a very bad one of *sordida* (typical), figs. plt. 40a are much better showing *sordida*, *mediana*, *ochracea*, and *anceps*.

Culot, *N. et G.*, I(1). plt. 28, f. 8 (1909-13) is a good figure of the darker *anceps* form.

Of the Variation Barrett say—"Usually not variable, or only slightly so in the depth and extent of brown marbling and marking on the forewings."

Barrett records a specimen which "had a curious curved white streak from the reniform stigma running into the apex of the wing."

Tutt says of the species *B.N.* I. 111, "Another very variable species," but both Guenée, *Noct.* V. 195, and Barrett say that the variation is unimportant, and so far as I know I agree with them.

The Forms and Names to be discussed are—

sordida, Bork. *Naturg.* IV. 578 (1792). *Culot. N. et G.* I(1) plt. 28 f. 8.

ab. *anceps*, Hb. *Samml. Noct.* fig. 484 (1808-18).

f. *infesta*, Ochs. and Treit. *Schn.* V(2). 112 (1816-25).

race *aliena*, Dup. (nec Hb.) *Hist. Nat.* VII. 29. plt. 102. 2 and 6 (1827).

ab. *renardii*, Bdv. *Ind. Meth.* Add. 5 (1829).

ab. *engelhardtii*, Durr. *Ent. Med.* II. 85 (1889).

ab. *ochracea*, Tutt. *Ent.* XXII. 230 (1889). Warr.-S. *l.c.*

ab. *mediana*, Warr.-Seitz. *Pal. Noct.* III. 167. plt. 40a. (1911).

ab. *sordidula*, Strnd. (Hamp). *Lep. Phal.* VII. 207. (1903).

ab. *nigricans*, Hanne. *Int. ent. Zeit.* X. 121 (1917).

ab. *lactea* (Cockayne in lit.).

Tutt dealt with (1) *sordida*, Bork. the typical grey with dirty brown mottling. (2) *anceps*, Hb., a dark grey mottled with reddish ochreous. (3) *ochracea*, Tutt, wholly reddish ochreous and (4) *renardii*, Bdv., a pale unicolorous grey form.

f. *infesta*, Ochs. and Treit. *Schn.* V(2). 113 (1825).

ORIG. DESCIP.—"Head, thorax, collar and patagia are earth grey; the two last with a blackish edging. The antennae light grey with fine teeth in the male. On the thorax stands a double crest. The abdomen is lighter than the thorax, with whitish hairs at the base, a strong anal tuft, and small dark tufts on the middle of the upperside. The feet are grey, annulated yellowish white below. The forewings have the ground colour of the thorax and are mottled grey and pale grey. The shape and size of the whole creature is like the well-known *M. brassicae*. The transverse lines are mostly indistinct. That at the base is half; the first complete, light on the inside, dark margined on both sides, with the second line wholly enclosing the reddish central area containing the half-moon like discoidal. The two stigmata have blackish centres, the reniform somewhat white, the claviform indistinct. The waved band is light, with somewhat glossy and obsolescent blackish spots towards the outer margin. The toothed line contains in its centre a dull W. The fringes are chequered grey and yellowish. The hindwings are white-grey, with blackish veins and an obsolescent band towards the yellowish white fringes. The wings are white-grey on the underside, the fore-wings more so than the hindwings, grey powdered and with a glossy curved line."

aliena, Dup. *Hist. Nat.* VII(1). 29 (1827). nec. Hb. and Tr.

FIG.—*l.c.* VI. plt. 102, 2 and 6.

ORIG. DESCRIP.—“This *Noctua* much resembles that of the cabbage (*brassicae*) by the characters of the forewings; but their colour is consistently of a flaxen grey. They are crossed by three waved lines which are of a lighter colour and margined by red, as are also the two ordinary stigmata. A sinuous band of a bluish tint runs along the outer margin. The fringe is brown and interrupted by yellowish. The lower wings are of a pale flaxen, and suffused with brown at their margin. The underside of the four wings is of the same flaxen, and slightly dusted with brown at their anterior margin.” France.

In his *Cat. Meth.* p. 127 (1844) Dup. places *aliena*, Dup., *anceps*, Hb., and *sordida*, Bork. as the *infesta*, Ochs. and Treit. His fig. 6 is a generally much paler insect throughout with a tendency to ochreous.

ab. *engelhartii*, Duurloo. *Ent. Med.* II. 86 (1889):

ORIG. DESCRIP.—“*Hadenae sordidae* affinis, sed multo dilutior, alis anterioribus supra albedo-cinereis, interdum pallide brunneo mixtis, maculis orbiculari et reniformi, strigis transversis margineque anteriore aliquanto dilutioribus; linea undulata obsoleta, apicali solum distincta; binis brevibus strigis longitudinalibus nigris, vulgariter valde distinctis, a basi exeuntibus; costis areae limbatis nigro-et albo punctatis: subtus et alis posterioribus *Hadenae sordidae* similibus sed dilutioribus.” Jutland. In ora maritima versans.

ab. *mediana*, Warr.-S., *Pal. Noct.* III. 167 (1911).

FIG.—*l.c.* plt. 40a.

ORIG. DESCRIP.—“The brown grey ground colour is without dark speckling; the inner and outer lines are single, black, and distinct, the outer with clear black teeth on the veins, the median shade, generally inconspicuous, is thick and black, distinctly angled outwards on subcostal and veins 1 and 2; the space between it and outer line deeper brown; the markings of the hindwing clearer.” Germany. ♂. “Appears very distinct.”

ab. *sordidula*, Strand. *Arch. Naturg.* LXXXI. 154, abt. A. Heft. 11 (1915).

ORIG. DESCRIP.—“The ground colour of the forewings is greyer and the post-median area is coloured bright red.” Amur, Korea, Japan.

f. *nigrescens*, Hanne. *Int. ent. Zt.* X. 121 (1917).

ORIG. DESCRIP.—“Ground colour much darkened with black grey.”

ab. *lactea*, ab. nov. (Cockayne *in litt*).

ORIG. DESCRIP.—“Head, thorax, abdomen, and ground cream-coloured. Thin blackish transverse line on middle of collar; abdominal crests tipped with light brown; basal, first, and second lines brown with lighter brown clouding proximal to first line; the central shading in orbicular and reniform and the lines between first and second lines are also lighter brown and very distinct; distal to second line is a row of black dots on nervures 2, 3, 4, 5, 6, and 7 and along termen is a row of minute interneural black crescents; the marginal dark band is only indicated as a faint shade between nervures 5 and 6 and as a crescentic mark near inner angle; fringes chequered, cream-coloured

at nervures and brown between; hind-wings cream-coloured with brown scaling along proximal part of nervures and with the usual dark bands cream-coloured and only slightly darker than the ground; a very narrow brown line runs along the margin between the nervures; fringes white. The almost unmarked creamy outer part of the fore-wings gives it an appearance very different from other forms: I have seen two specimens, of which mine, a male, is from Freyle, Hants."

Dr. E. A. Cockayne has very kindly made this description after showing me the specimen. So far as one can understand from the descriptions the pale forms named register degree of albinistic character:—*renardii*, *engelhartii*, *lactea*.

The *aliena* of Steph. III. III. 4, is often included as a *sordida* form but the description is not that of a *sordida* form, but may be the *aliena* of Hb. 441 (a continental species).

Mamestra, Ochs., Hb., Treit. (1816-22-25) Dup. Gn. Tutt [*Hadena*, Schrnk. (1802) Fr., Stdgr., Barr., Splr., Cul., Meyr.: *Tholera*, Hb. (1822): *Polia*, Ochs. and Treit. (1816-25) Ev., H.-S.: *Trachea*, Ochs. Hb. Treit. (1816-22-25), Hamp.: *Hama*, Steph. (1829) Stb.; *Crymodes*, Gn. (1852) Warr.-S.] *furva*, Hb. (1808).

The species name *furva* occurs in Schiff. *Verz.* 81 (1775) but the description is quite inadequate for discrimination. Illiger and Hafali, *Verz.* IIed. (1801) give Esp. *Abbild. Bomb.* plt. 64, fig. 5 of *melaleuca* (1786) as representing *furva*, Schiff. and Bork. *Naturng.* IV. 587 for a description of it. Esper's fig. represents a form of *lutulenta* with its white hindwings and white body. (*Teste* Werneberg.) The description in Bork. *Naturng.* IV. 587 corresponds with this figure under the species name *furva*. In such absolute confusion Hübner's name *furva* stands by priority for our species, *i.e.*, *furva*, Hb. (1808).

Tutt, *Ent.* XXII. 231 (1889): *Brit. Noct.* I. 113 (1891), IV. 107 (1892): *Lep. Br. Is.* IV. 382, plt. 176 (1897): *Stdgr. Cat.* IIed. 172 (1901): *Splr. Schm. Eur.* I. 191, plt. 40, 12 (1905): South, *M.B.I.*, I. 271, plt. 131, 3-4 (1907); Hamp. *Lep. Phal.* VII. 206 (1908): Warr.-S. *Pal. Noct.* III. 177, plt. 41 (1911): *Culot N. et G.* I(1). 158, plt. 28, 6-7 (1909-13).

Hüb. *Samml.* fig. 407 is a unique form, with which no one is acquainted exactly. H.-S. says, *Sys. Béarb.* II. 276: "I know of no example so red brown, nor so large, nor with so broad forewings."

Hübner's notes on *N. furva*, *Samml. Noct.* Text: p. 187. refer to fig. 407. (1808): "Antennae stone brown: wings with the usual-shaped, pale, dark-centered spots (stigmata), bestrewn with short black streaks, and marked with pale waved lines; the lower wings greyish white, shaded on the outer margin and with a pale waved line running through this shade; the abdomen coloured as the hindwings." = *furva* of Schiff. A poor and insufficient description.

Freyer's fig. *Abbild.* II. 159, is dark with marking typical in position but the lighter portions are too light in contrast.

Evers. *Fn. Vol.-Ural.* p. 248 says that *infernalis* is *furva*, and in his *Noct.* IV. (1856) p. 103 treats his *silvicola* as a *Dianthoeia*, as it "has great affinity with *glauca*."

Dup. *Hist. Nat. Sup.* III. 276, plt. 25, f. 5, has a good figure of the Hübner type, but the light markings are too white, an emphasis which British examples never show; it represents one of the darker forms.

Stdgr., *Cat.* II^{ed.}, treats *silvicola* as a distinct species. Hampson *Lep. Ph.* IX. categorically omits it. Warr.-Seitz restores it to *furva* as a melanic race of that species.

Warr.-Seitz *Pal. Noct.* plt. 41f gives 3 figs., a ♂, which to my mind is certainly not *furva*, a ♀ darker, and *freyeri* still darker brown. In the ♂ fig. the black edging of the 2 transverse light lines, defining the wide central band, is outside these lines instead of being inside as it always is in *furva*.

Culot *N. et G.* I(1). plt. 28 f. 6, has a very good figure of the usual form of *furva*. In f. 7 he shows *italica*, Trti. a larger, darker ground and whiter lined form.

Barrett says of the Variation "Hardly variable except that it becomes more richly coloured and darker in the North of Scotland, and very black in the West of Ireland."

The Names and Forms to be discussed are as follow:—

- furva*, Hb. (1808). *Samml. Noct.* f. 407.
- ab. *freyeri*, Frr. (1838). *Neu. Beitr.*, II. 107. plt. 159.
- ab. *infernalis*, Evers. (1842), *Bull. Mosc.* 547.
- ab. *silvicola*, Evers. (1842). *l.c.*
- ab. *gemmosa*, H.-S. (1846). *Sys. Bearb.* II. 276. f. 427.
- ab. *ochracea*, Tutt (1889). *Ent.* XXII. 231.
- r. *italica*, Trti. (1911). *Bull. Soc. ent. It.* XLIII. 182; Culot *N. et G.* plt. 28. 7.
- ab. *nictitans*, Lenz (1927) *Osth. Schm. Sudbay*, II(2). 275. plt. XIV. 12.

In the Appendix, *Brit. Noct.* IV. 107 (1892) Tutt gives the omitted original descriptions of both *infernalis*, Evers. and *silvicola*, Evers. and points out that Staudinger *Cat.* II^{ed.} suggests that *silvicola* is a dark var. of *rubrinena*. Tutt adds that the description of *silvicola* would do very well for the very dark Irish form of *furva*.

ab. *gemmosa*, H.-S. *Sys. Bearb.* (no description).

FIG.—*l.c.* fig. 427 (1846).

ORIGINAL DESCIP.—(I have described the figure as follows)
 "Slaty brown ground, with a reddish brown broad central fascia bounded by the broad light grey inner and outer crenulated lines; the crenulations of the inner line being few. The discal side of these lines is edged with deep black and an irregular black narrow band crosses the wing irregularly between the stigmata, but is only deep black to the centre of wing. There is a broad partial line from costa near base to another in the submargin, both edged by deep black on the discal side. The latter has a W quite unemphasized. There are numerous lighter smears along the costa, in the wide discal band, and near the base. The two stigmata are broadly outlined with

light grey. The hindwings are dark slaty grey with a lighter ill-defined band across the disc, and light marks near the margin." In the Index H.-S. suggests *Polia* as the genus.

It is quite unlike our *furva* in general appearance and colour.

f. italica, Trti. and Vrty. *Bull. Soc. ent. It.* XLIII. 182 (1911).

FIG.—Culot. *N. et. G.* I(1). plt. 28. f. 7 (1909-13).

ORIG. DESCIP.—"It is separable from the typical form by its very bright brown colour, and by a very suffused yellowish colour which wholly avoids the lines and spots, in this recalling somewhat the figure 497 of H.-S. named *parida*. Thus the smaller lines show very white and not yellowish; the hind wings too are differently marked. The marginal fascia of the hind wings of *italica* is in fact very diffused and obsolete and the discal area is quite clear. Most of the specimens are larger than normal *furva*, Hb. One places them therefore somewhat nearer to the *maillardi*, Hb.-G." Italian side of Mt. Rosa.

ab. *nictitans*, Lenz. *Schm. Sudbay.* II(2). (1927).

FIG.—l.c. plt. XIV. 12.

ORIG. DESCIP.—"With conspicuously pale reniform."

Mamestra, Ochs. (1816) Hb. (1822) Treit. (1825) Steph., Led., Stögr. II., Ent. L., Pierce, South. [*Polia*, Ochs. and Treit. (1816-25) H.-S.: *Melanchra*, Hb. (1822) Meyr.: *Trichoclea*, Grote. (1883) Hamp., Warr.-S.: *Barathra*, Hb. (1822).] *albicolon*, Hb. (1808-18).

Sepp's figure *Besch. Wund. Gods*, II. plt. 1, 1-3, is the original, but is without name, which was bestowed by Hübner (1808-18), figs. 542-3, and described (roughly) in his *Teut* p. 192. Treit. *Schm.* V(2). 147, describes it more adequately. Thus Stögr. is correct in ascribing the name to Hb. and not to Sepp nor Treit.

Hübner's example agreed with eight other specimens, which Treit. compared and from which he made his description.

Tutt *Ent.* XXII. 251 (1889): *Brit. Noct.* I. 114 (1891): Barr. *Lep. Brit. Is.* IV. 207. plt. 160 (1897): Stögr. *Cat. Ed.* III. 156 (1901): Splr. *Schm. Eur.* I. 170. plt. 36 (1905): Hamp. *Lep. Phal.* V. 238 (1905): South, *Moths Brit. Is.* I. 240. plt. 120 (1907): Warr.-Seitz *Pal. Noct.* III. 83. plt. 21 b. c. d.: Culot. *N. et. G.* I(1). 100. plt. 17 (1909).

Sepp's figure is a good one but the wings are too long and pointed.

Stephen's figure 3 on plt. 24, *Illus.* II (1829) looks more like *brassicae*.

Dup. *Hist. Nat.* VII(1). plt. 117, f. 3. has a good figure, somewhat small, with the colon mark.

Freyer, *Neu. Beitr.* VI. 501, gives a very good well-marked figure, and on plt. 592 he gives a second figure with more white minute markings.

Splr. *Schm. Eur.* I. plt. 36, f. 21., gives a fair figure, somewhat small, but without the colon mark.

South. *M.B.I.*, I. plt. 120. 7-8, has two very good figures.

Warr.-S. *Pal. Noct.* III. plt. XXI. b.c.d. figures *albicolon*, which he

ascribes to Sepp, a very good figure; *cinerascens*, Tutt, 2 figs. hardly separable; *odiosa*, Stdgr. dull ochreous brown.

Culot, *N. et G.* I(1). plt. 17, f. 2, has a very good figure of *albicolon*. On plt. 18, f. 3, *egena* from S. Russia is figured, but it does not agree with the description as given below, in fact is not recognisable as being a form of *albicolon*.

Of the Variation Barrett says—"Usually very little variable except in the degree of umbreous rippling and dusting; occasionally this is so increased as to obliterate all the pale ground colour. There seems to be a slight variation on the North-east coast, specimens from Durham being sometimes more prettily mottled, with the transverse lines usually more distinct."

Barrett records a specimen "in which the yellow dots of the sub-terminal line run inwards in yellow dashes."

He also records specimens, "from the east coast of Scotland which are nearly black."

Hamp. *Lep. Ph.* V. also gives Sepp as author, his short diagnoses are:—*egena* paler, more luteous, even in colour; *arida* duller, more fuscous, h.w. unif. fus. brn.; *odiosa* dull ochr. brn. h.w. ditto.

Stdgr. *Cat.* III. ed. 156, refers to (1) *arida*, Stdgr. *Iris*, IX. 255 as "ab. minor, multo pallidior al. ant. lutescenti-griseis" as the same as *egena*, Led. and (2) to *arida*, Led. as "paullo obscurior, al. ant. rufescenti-griseis."

Hübner, *Samml. Noct.* figs. 542-3 figures 2 forms, 542 a dark greyish black form with most markings indistinct, the typical form, and 543 a yellowish testaceous grey, which Gn. calls var. A. and to which Tutt gave the name *brunnea*. Guenée says he does not know the type form.

Guenée refers to the form of Stephen's *Illus.* II. 195, plt. 24, f. 3, (1829), a cinereous grey form, which Tutt subsequently named *cinerascens*.

The Names and Forms to be considered are:—

albicolon, Hb. (1808) [Sepp. II.] *Samml. Noct.* f. 542-3, *Text.* 192 (1905-18).

ab. *egena*, Led. (1853). *Verhand. z.-b. Ges. Wien.* 371. Culot, *N. et G.* plt. 18. f. 3.

ab. *arida*, Led. (1855). *l.c.* 108. plt. 1. fig. 7.

ab. *brunnea*, Tutt (1889). *Ent.* XXII. 251.

ab. *cinerascens*, Tutt (1889). *l.c.* Warr.-Stz. *Pal. Noct.* plt. 41.

ab. *odiosa*, Stdgr. (1895). *Iris.* VIII. 315. Warr.-Stz. *Pal. Noct.* plt. 41.

r. *amydra*, Püng. (1901). *l.c.* XIV. 182. plt. 2, f. 4.

Tutt deals with *brunnea*, dark brown with clear markings; and *cinerascens*, ashy grey, thickly sprinkled with darker atoms.

albicolon, Hb. *Samml. Noct.* (1805-18) ?

FIG.—*l.c.* 542-3.

ORIG. DESCIP.—"Clay grey, the wings of this species marked with pale and black wavy streaks; the reniform indicated by only two white dots, the lower wings are brownish white, bordered with blackish grey scaling. The abdomen also almost blackish." Austria. From Ochsenheimer's specimens.

ab. *egena*, Led. *Verhand. z.-bot. Gess. Wien.* 371 (1853).

FIG.—Culot. *N. et G.* I(1). plt. 18. f. 3.

ORIG. DESCRIP.—“Is very like *albicolon*, but yet distinctly differs from it. The ground colour of the forewings is a uniformly (trübes) clay yellow (as in *immunda*). The reniform stigma does not stand out so sharply as in *albicolon*, the hindwings are much darker and from the base to the outer margin are uniformly grey, but their fringes are darker; all the rest as in *albicolon*.”

Hamp. *Cat. Lep. Ph.* V. 238 (1905), “Fore-wing paler, more luteous and even in colour.”

The figure is small for *albicolon*, and as the author says, although very indistinctly marked it is more marked than any other example he has, it may be an exceptionally marked high level form.

ab. *arida*, Led. *Verh. zoo-bot. Ges. Wien.* 108, plt. 1, f. 7 (1855).

FIG.—*l.c.* plt. 1, f. 7.

ORIG. DESCRIP.—“In size and appearance like *gemina*, in colour more like *basilinea*, but easily distinguished from *basilinea* by the want of the black longitudinal branched streaks at the base of the forewings, from the pale varieties of *gemina* by the absence of the W marks in the light waved line, from both of these by the want of the tuft of the abdomen and therein agrees more with *testacea* and *rubella*. Forewings dull clay yellow, arrangement of markings as in *basilinea*, the branched transverse line at the base, as already noted, wanting, the half transverse line in its place very obsolescent. The two middle lines arising as in *basilinea* from darker costal spots, but are nearer towards the base, the discal area is therefore more narrowed than in *basilinea*. This is not darker than the rest of the ground, the central shade is distinct, dusky grey-brown, the stigmata are shaped and figured as in *basilinea* (the orbicular is of too great a length in my figure) both filled in with dark grey brown, the other stigma is not emphasised. The light waved line is a little paler than the ground, obsolescent and without the W. Between it and the outer middle line stand on the costa two pale clay yellow spots. Fringes clay yellow, on the veins somewhat paler. Hindwings light yellow grey with paler fringes separated by blacker marginal line.” Central Asia.

The figure of *arida* is small and very well-marked for the usually obscure *albicolon*. Lederer says that the ♂ genitalia places it near to *testacea*, *dumerilii*, etc., and the facies near to *basilinea*, *gemina*, etc.

ab. *odiosa*, Stdgr. *Iris.* VIII. 315 (1895).

FIG.—Warr.-S. *Pal. Noct.* plt. 41.

ORIG. DESCRIP.—“Fore-wing dark blackish-grey with 4 slightly emphasised darker transverse lines, lighter margined and two stigmata not visible in the upper part. Of the transverse lines the extra basal and the outer in the 2 males show quite distinct, the latter is strongly toothed. The outer line was brought out by the light dot-like spots darkly margined on the inner side in one male. Except from the far darker colour, the somewhat variable markings of *odiosa* are so like those of *egena* that I can find no difference. Before I had very light grey specimens of *egena* from Central Asia, I was certain that *odiosa* was a dark form of that. The hindwings are also far darker,

they show on the underside a distinct dark discoidal and also a perfect dark transverse line, which is only very rudimentary in my Central Asian *egena*."

Hamp. *Cat. Lep. Ph.* V. 238 (1905). Fore-wing dull ochreous brown; hindwing uniform fuscous brown.

race *amydra*, Püng. *Iris.* (1901) XIV. 182.

FIG.—*l.c.* pl. 2, f. 4.

ORIG. DESCRIPT.—"Expanse 36mm. Forewing 16mm. Forewings dull yellow-grey, the inner middle line toothed, slightly bowed, the outer distinctly toothed on the veins, the upper stigmata are very indistinct, the median area and included with it the central shade a little darker, also the waved line not distinctly marked; fringes with a paler basal line; hindwing darker not lighter towards the base, the fringes paler; underside uniform yellow-grey with indistinct curved line and pale centred middle spot in the hindwing: antenna-shaft smooth, in the ♂ short haired, palpi thickly haired straight, terminal joint stumpy and short; eyes thickly haired, legs without spines.

"There lie before me many pairs of this inconspicuous and uniformly toned species of which the ♂ figured is the strongest marked example. It is classed with *albicolon*, Hb., v. *egena*, Led. and *sabulorum*, Alph.; the colour is duller and the marking is more obsolescent than in *egena*; the forewings are more pointed, the hindwing similarly dark, also the underside; the ciliation of the ♂ antenna is somewhat longer. The equally dull but more distinctly marked *insolita*, Stdgr. is almost similar, which I consider for a true *Mamestra*, but it has somewhat different markings, longer ciliated antennae in the male, whitish hindwings with wider, darker outer band and strong middle character, the underside is much paler with a more distinct curved line." Central Asia.

Mamestra, Ochs. (1816), Hb. (1822), Treit. (1825), Hamp. and Westw., South, L., Tutt, Barr., Stdgr., Pierce [*Polia*, Ochs. and Treit. (1816-25): *Barathra*, Hb. (1822), Hamps., South, Warr.-S.: *Melanchra*, Hb. (1822) Meyr.] *brassicae*, Linn. (1758).

All the old authors treat of this species as do the modern ones, and there are many figures largely indifferent or bad.

Tutt, *Ent.* XXII. 251 (1889): *Brit. Noct.* I. 115 (1891): Barr. *Lep. Br. Is.* IV. 210, pl. 160, 2 (1897): Stdgr. *Cat.* IIIed. 156 (1901): Hamp. *Lep. Phal.* V. 12. (1905): Splr. *Schmett. Eur.* I. 169. pl. 36, 18 (1905): South, *Moths Br. Is.* I. 239, pl. 120, 3, 6 (1907): Warr.-Seitz, *Pal. Noct.* III. 67, pl. 15ef (1909): Culot, *N. et G.* I(1). 99, pl. 16, 18, pl. 18, 2 (1909-1913).

Roesel, *Belust.* I. pl. 29 (1746), has a v. good fig. except that the brown tint is too emphasised.

Ernst and Engr. *Pap. d'Eur.* VII. f. 456 give three forms called *brassicae*. 456d has a ground of yellowish brown, never seen in British examples, 456e is almost unicolorous very dark grey, while 456f is a more mottled form, with a not so dark ground and having on the outer marginal area of the forewing an irregular wide light ochreous line (*albodilinea*?)

Esper., *Abbild.* IV, plt. 159, gives two poor figs. of the continental form, a ♂ with ochreous marking and a dull grey ♀; both have the contrast of light and dark far too emphasised.

Hübner in his *Verz.* 218 (1822) gives fig. 88 and 484 as *brassicae*. On the plate 484 is named *anceps* (1808-18). In his Text no reference is made to fig. 484 (1805-?).

Fig. 88 of Hüb. is a strong brown example. I have never seen one like it in general colour. The "*anceps*" fig. 484 is of a very rich brown, russet colour and although the markings are *brassicae* it has no tone of our *brassicae* in it. The white is totally suppressed.

Hübner's description, Text *Noct.* 191 (1805-?) is "Dark clay grey: earth brown mixed: the wings with pale ordinary spots (stigmata) and waved line; black marked as the more common species; the hindwings shaded ashy-grey: the abdomen similar." Kohlfelder = *brassicae*, L. Although briefly indicating *brassicae*, this description hardly agrees with the two figures 88 and 484 of Hb.

Of Hübner's fig. 88, H.-S. says "Too light and yellowish, forewings somewhat too pointed."

Dup., *Hist. Nat.* VII. plt. 102, gives a very good figure of the common form of *brassicae*.

Steph., *Ill.*, II. plt. 24, fig. 3, is given by Tutt as the form *albicolon* of *brassicae*. It is only with great doubt that one can put this bad figure down as *albicolon* (sens. str.) or even a *brassicae* form (in my copy of Stephens). There is no ochreous mottling as Tutt says, nor ochreous stigmata. The submarginal waved line is wide and almost straight, and perhaps slightly ochreous on the left side, on the right side it is broken up into spots badly defined. The general mottling is very unlike that of *brassicae*. There is no claviform and the general tone is darkish dove-colour, such as I have never seen in this species. The figure and description are not in agreement. It is possible, and may be probable, that Stephens confused a mottled form of *brassicae* with *albicolon*. Tutt appears to have used Stephens' *albicolon* for both species.

Mr. Fletcher points out (in lit.) that Stephens refers to Hübner's figures of *albicolon*, 542-3, which are undoubtedly not *brassicae* but *albicolon*, and that in his *List of Brit. An. Macrolep.* p. 93 (1856) Stephens considered his *brassicae* and *albicolon* to be distinct.

In the copy of Stephens *Ill.* in the Ent. Soc. Library the fig. named *albicolon* is a *brassicae* form and not like the figure in my copy in general tone, etc. There is a white subterminal line with a wide black outer margin, the two stigmata are black with dirty white surround, and there is a dirty white line from base along the top of the two stigmata. The ground colour is *not* dove-colour.

Hump. and West. *Brit. Moths*, I. plt. 36, illustrate our browner form of *brassicae* and the very dull form, but the figures are badly drawn with wings too pointed.

Newman's fig., *Brit. Moths.* 300 (1869) is a *unicolor*, dull blackish grey form with much suppression of markings.

In *Brit. Noct.* IV. 107, Tutt gives the original description of *decolorata*, *Stdgr. Stett. e. Zeit.* p. 34 (1889), and as the description agrees with that of Tutt's *ochracea* described in *Ent.* XXII. some months later, the name *decolorata* takes precedence. Amur.

Warr.-Seitz *III.* plt. 15ef, has 6 figures, but the coloration is very inferior. Markings only can be noted. They are *albidilinea* with a

light submarginal line, *unicolor* of Tutt, *straminea* ♂ and ♀ of Failla-Ted., which Warr. says=? *andalusica*, Stdgr., *decolorata* of Stdgr. and *brassicae* typical. Warr. puts *albicolon*, Steph. and *ochracea*, Tutt, as identical with the typical form. He suggests that *canescens*, Moore, may be *decolorata*, Stdgr.

Culot, *N. et G.* figures a typical brown form not so dark as a British form on plt. 16, f. 18, and on plt. 18, f. 2, *andalusica* with much dull ochreous coloration. The figures are very good.

Barrett says of the Variation:—"Usually only variable in the extent and depth of the black or dark mottling, and this to no very great degree; also in the distinctness or obscurity of the subterminal line; but occasional specimens are extremely pale, while others have the dark mottling so increased as to render the entire forewings black-brown, the reniform stigma and the subterminal line only remaining normal."

Barrett records a specimen "in which the subterminal line is wholly obliterated."

He also records others "in which it is very broad and of a clear yellow."

Stephens, *Illus.* II. 195, speaks of cinereous and dusky examples, and one "suffused with a rosy tinge and with a distinct ferruginous spot on the inner margin near the base."

List of Forms and Names to be considered.

brassicae, Linn. *Sys. Nat.* Xed. 516 (1758).

ab. *albidilinea*, Haw. *Lep. Brit.* 191 (1809): Warr.-S. *Pal. Noct.* III. plt. 15.

r. *albicolon*, Steph. *Ill.* II. 194, plt. 24, 3 (1829).

ssp. *andalusica*, Stdgr. *Cat. led.* 90 (1861): Culot *N. et G.* plt. 18, 2 (1909-13).

r. *canescens*, Moore, *Ann. and Mag.* (1878) 5 ser. I. 233.

ab. *scotochroma*, Rüb., *Iris.* I. 340, plt. 12, 13 (1884).

ab. *decolorata*, Stdgr. *Stett. e. Zt.* 34 (1889): Warr.-S. *l.c.* plt. 15.

ab. *ochracea*, Tutt, *Ent.* XXII. 251 (1889).

ab. *unicolor*, Tutt, *l.c.*: Warr.-S. *l.c.* plt. 15.

r. *straminea*, Failla. *Nat. Sic.* X. 30, plt. 1, 5 (1890): Warr.-S. *l.c.*, plt. 15.

Tutt says in *Br. N.* IV. 107, that his *ochracea* falls before *decolorata*, Stdgr.

Tutt treats of (1) *brassicae*; (2) *ochracea*, the pale ochreous form; (3) *albicolon*, Steph. the more mottled form; (4) *unicolor*; (5) *albidilinea* with white marking; (6) *andalusica*; (7) *decolorata*.

f. *albicolon*, Steph. (Tutt). It does not seem to me that this name has any validity as the data are most confusing and uncertain.

ab. *canescens*, Moore *Ann. & Mag.* 5 ser. I. (1878) p. 233.

ORIG. DESCRIPT.—"Forewing brownish grey; orbicular and reniform marks greyish white, with narrow black border; a short double black streak below the base of the cell, and a quadrate mark below the orbicular spot; an indistinct pale submarginal, irregular fascia, and

black marginal lunular line with whitish inner border; hindwings pale greyish brown. Thorax and abdomen greyish brown; antennae brown. Underside glossy pale greyish brown, both wings with indistinct short transverse discocellular streak." Yarkand (4449 ft.).

Hamp. included *canescens*, Moore, under the synonymy of *trifolii* (*chenopodii*) but does not otherwise mention it. *Lep. Phal.* V. 29.

Swinhoe, *Cat. Moths of India*, p. 319, places *canescens* next to *brassicæ* but without comment.

ab. *scotochroma*, Rüb. *Iris.* I. 340 (1884).

FIG.—*l.c.* plt. 12. fig. 13.

ORIG. DESCRIP.—"There lie before me two specimens ♂ and ♀ of a *Mamestra* caught at Dresden in the summer of 1887. Both examples are distinguished by the almost complete absence of the golden sheen usually found on the inner margin of the forewing near the base and along the white border line, thus there are only rudimentary traces of the white border line, and the much darker ground colour prevails. The usual large white spot present in the reniform stigma in the female, is only represented by a quite insignificant whitish atom, while in the male it shows no divergence from the usual form. Although the female is in nearly faultless condition, yet it contains no trace of a thoracic crest, the male possesses a quite undeveloped one on the first three segments. In both specimens the hindwings approach the colour of the forewings, much darker than in *brassicæ*, and the dark marginal band on the underside is sharper, bent and more removed to the middle. Eyes antennae and annulation of the fore-legs are as in *brassicæ*."

Hamps. *Cat. Lep. Ph.* V. 12 (1905) merely says "Melanic."

ab. *decolorata*, Stdgr. *Stett. e. Zt.* 34 (1889).

FIG.—Warr.-Seitz. *Pal. Noct.* III. plt. 15.

ORIG. DESCRIP.—"A number of specimens of this common species, collected (die Ruckbeil) south from Issykul, are far paler and markingless than typical *brassicæ*, and I denote them as var. *decolorata*. They come near my var. *andalusica*, but are not as they are yellow- or brownish-grey, but white-grey. The black transverse lines are more or less rudimentary, the rest of the markings in individual specimens of var. *decolorata* are almost obsolescent, so that the transverse line with the M before the outer margin in one female is quite gone, in two others nearly. The hindwings also, particularly on the underside, are lighter and the latter completely wants the dark transverse line. Single examples come almost quite like the typical *brassicæ*, so that this var. *decolorata* appears to be only the prevailing form of this locality "S. of the Issykul." The *brassicæ* which I have from Margelan are as dark and almost identical with the European specimens.

ab. *straminea*, Failla. *Nat. Sic.* X. 30 (1890).

FIG.—*l.c.* plt. I. fig. 5.

ORIG. DESCRIP.—"This very beautiful aberration is distinguished chiefly for its general tone of pale straw yellow, by the usual lines being well marked in black and by the stigmata of a deep yellow colour, as is also the antemarginal fascia. The lower wings as well as the whole body is of the colour of the forewings. The rest of the markings

conform to the diverse appearance of the other forms." A single example from near Castelbuono.

Hampson's short diagnoses are:—

ab. *scotochroma*, Röber.—Melanic.

ab. *andalusica*, Staud.—Paler, the forewing yellowish grey, and without rufous tinge.—S. Europe.

ab. *decolorata*.—Much paler, forewing whitish grey.—W. Turkestan.

Mamestra, Ochs. and Treit. (1816-25) Dup., Gn., Tutt, Barr., Stdgr., South, Splr., Pierce, Culot. [*Polia*, Ochs. and Treit. (1816-25) H.-S., Hamp., Warr.-Seitz: *Melanchra*, Hb. (1822) Meyr.] *persicariae*, L. (1761).

Hüfnagel, *Berlin Mag.* III. 308 (1766), described this species under the name *sambuci*.

ORIG. DESCRIP.—"Black with a few pale indistinct markings, and a white spot in the middle of the upper-wing." Rott. *Naturf.* IX. 128, testifies that this is the *persicariae*, Linn.

Illig. *Verz.* I. 198, testifies to the *persicariae* of Schiff. *Verz.* 71 (1801).

Tutt, *Brit. Noct.* I. 117 (1891): Barr. *Lep. Brit. Is.* IV., 212, plt. 160 (1897): Stdgr. *Cat.* III ed. 156 (1901): Splr. *Schm. Eur.* I. 170, plt. 76 (1905): Hamp. *Lep. Ph.* V. 105 (1905): South, *Moths Br. I.* 239, plt. 130 (1907): Warr.-S. *Pal. Noct.* III. 72, plt. 16hi (1911): Culot *N. et G.* I(1). 100, plt. 17 (1909-13).

Rosel *Ins. Belust.* I(2). plt. 30, has two good figures.

Ernst. and Engr. *Pap. d'Eur.*, VI. figs. 335, give 3 very good figures, 335d. a typical form with dominantly white reniform, 335f. a grey form with brownish bands and markings which may represent the "hoary grey" form of Barrett, and 335g. a *unicolor* form (not *accipitrina*, Warr.-S. and Auct.)

Spuler, *Schm. Eur.* I. 107, takes the brown reniformed *accipitrina* as the *unicolor*, Stdgr.

Hampson, *Lep. Phal.* V. 105, by inference, does the same, he says, the "reniform is not filled in with white."

In my copy of Hb. the fig. 64 of *persicariae* has a reddish reniform encircled with white, and in his Text, p. 176, he says of the reniform, "a white brown-centred spot." These items do not agree with our British form where the white of the reniform is dominant in amount and in purity.

Dup., *Hist. Nat.*, VII. plt. 102, has an excellent figure: although the white is well pronounced in the reniform the red central portion is somewhat too spread.

South, *M.B.I.*, I. plt. 120., gives two very good figures.

Culot, *N. et G.* I(1). plt. 17, has a very fine fig. The reniform is dominantly pure white.

The fig. 4 on Esper's plt. CXXIX., as Stdgr. says, does not look like either a *persicariae* or even a *Mamestra*. The wing-shape is totally

different from that of the *persicariae* on the same plate. The markings, both on the upper and underside, are not those of *persicariae*.

Treit., *Schm.* V(2). 140, says that "*accipitrina*, Esp. cannot be a var. of *persicariae*," but he suggests it may be a form of *aliena*, Hb. He says that he has bred an example in which the reniform is wholly obsolete resembling the *accipitrina* form of *aliena*.

Gn., *Noct.* V. 200, says that from Esper's text *accipitrina* must be an accidental var. of *persicariae*.

Werneburg, *Beitr.* II. 42, says that the fig. *accipitrina* would pass for *saportae*, but that *saportae* does not occur in that part of Europe, where *accipitrina* was captured. It is not a variety of *persicariae* and can only be a variety of *adusta*.

Warr.-Seitz. says that *accipitrina*, Esp. and *unicolor*, Stdgr. are one and the same.

Japanese examples of *persicariae* are all larger than European.

It would appear that the *accipitrina*, Esper., plt. 129, and the Warr.-Seitz figure plt. 16i which has a reniform filled in with dark brownish yellow represent two different forms. The former as Werneburg suggests belongs to another species, possibly *adusta*, the latter the *accipitrina* of Continental collections, and not the *unicolor* of Stdgr. in which the reniform is completely obsolescent.

Variation.—Barrett says "Usually very constant in colour and marking." He records a specimen "having the forewing suffused with hoary grey."

The Names and Forms under consideration are:—

persicariae, L. (1761), *Fn. S.*, 319.

sambuci, Hüfn. (1766), *Beil. Mag.*, III. 308.

ab. *accipitrina*, Esp. (1788), *Abbl.*, IV(2), 393, plt. 129.

ab. *unicolor*, Stdgr. (1871), *Cat.*, IIed., 91.

Tutt dealt with (1) typical *persicariae*. (2) ab. *accipitrina*. (3) *unicolor*, the form without white in the reniform.

Hampson says that *accipitrina* has "Forewing with the reniform not filled in with white."

The name *sambuci*, Hüfn. is dealt with above.

Crymodes exulis, Lefbv.

Crymodes, Gn. (1852) Barr., South, Warr.-Stz. [*Hadena*, Shrnk. (1802) Dup., Zett., Fr., Wocke, Hoffm., Stdgr., Splr., Cul., Meyr.: *Polia*, Hb. (*Tent.* 1806), O. and Tr. (1816-25), Hb., H.-S.: *Xylophasia*, Steph. (1829), Smith: *Eremobia*, Steph. (1829), Hamp.] *exulis*, Lefbv. (1836)=? *maillardi*, H.-G. (1834).

This boreal species shews extreme variability, hardly two specimens are alike, which added to its distribution in Labrador, Greenland, Iceland, Norway, the Shetlands, Scotland and, if it be the same as *maillardi*, the Pyrenees, Alps, Hungarian Mts., Finland, N. Russia?, W. and E. Turkistan Mts., renders it a most difficult species to discuss. It seems advisable to treat of all the named forms to both the above and there leave the matter for future work.

Hampson, *Lep. Ph.* VIII. 423 (1908) from a study of the B.M.

series, containing examples from the whole area of their distribution, states that the original was the *oleracea*, Mohr., *Isl. Naturh.* (1786). But as this name was already occupied in the then genus (*Noctua*) he (Hamps.) took the next available name, which was *maillardi*, Geyer, for the species name. Now *maillardi*, Gey., depicted a different form from the Icelandic *oleracea*, and Hampson, apparently, therefore took the description and figure in the *Zut.* 9, fig. 821-2 (1837) *diffusa*, the form with whitish streaks from the same locality, Iceland, as typical, and using for it the name *maillardi*, while in his summary of forms he places ab. 5 *maillardi*, as a large fuscous brown form without streaks on veins of fore-wings.

This action of Hampson's has added still more to the confusion.

Tutt, *Brit. Noct.* I. 118 (1891): Barr. *Lep. Br. Is.* IV. 124, plt. 151 (1897): Stdgr. *Cat.* IIIed. 172 (1901): Splr. *Schm. Eur.* I. 191, plt. 40 (1905): South M. B. I. I. 262, plt. 123 (1907): Hamp. *Lep. Ph.* VII. 423, fig. 70 (1908): Warr.-Seitz. *Pal. Noct.* III. 177, plt. 41g. (1911): Culot *N. et G.* I(1). 153, pls, 27, 28 (1909-13).

Freyer's fig., *Neu. Beitr.* V. plt. 411, 3 (1845), is a poor one.

Bdv. had an insect in his collection under the name *groenlandica*. He did not describe it but subsequently it was described by Duponchel in 1836 (*Hist. Nat. Sup.* III. p. 228).

Dup. *l.c.* refers to the names and descriptions of *sommeri*, *exulis* and *gelata* by Lefbv. (*Ann. Soc. ent. Fr.* 392, plt. 4 published just previously) and comments that the specimens were in such bad condition that he dare not be positive that his *groenlandica* was related to one of them.

Lefebvre's figures (*Ann. Soc. ent. Fr.*) of *sommeri*, *exulis* and *gelata* are very clear and distinct although we are told that the insects themselves were in such bad condition that every doubt existed as to their identity in comparison with other material.

(1) *sommeri*.—Alis anticis fusco cinereoque marmore, strigis duabus dentatis nigris albolimbatis, maculis ordinariis cineraceis porticis fulvo cinereis. Greenland.

(2) *exulis*.—Alis anticis fuscocinereoque variis, fascia media rufescente, maculis ordinariis cinereis, reniformi dilutiori striga postica dentata fulva, fimbria fulvo-fusco intersecta; posticis fulvo-cinereis, ciliis flavidis. Labrador.

(3) *gelata*.—Alis anticis fusco-cinereoque nebulosis, strigis tribus dentatis nigro fuscis, maculis ordinariis distincte albidis; posticis fulvo-cinereis margine fuscis ciliis flavidis. Labrador.

All three figs. have the crenulated trans. line almost exactly similar and with light emphasis outside. The central band in all three darkest on the inner margin. The inner line is also bounded by light emphasis but on the inside. In (1) the submarginal line is only just discernible; in (2) it is light cream; in (3) it is jet black. The disposition of colour and shading about the same in all three but varying in area more or less. In (1)-(3) there is a dark area between the stigmata which is not so pronounced in (2) *exulis*.

On plate XXI, figs. 3-4, Dup. figures ♂ and ♀, the former dark grey with dark brown median band bounded by whitish lines, inner and submarginal lines also whitish, as is the surround of the stigmata. The female is a rich chocolate brown with lighter and broader lines

and markings. The reniform and orbicular both extend to the costa and are lighter in colour, especially the reniform.

Dup., *l.c.*, plt. 49. 2, figures *exulis*. A good figure with light transverse lines and stigmata surrounds, but without the light veins. The median band is very dark chocolate, the ground is a much lighter mahogany brown. Fig. 3. *l.c.* depicts *gelata*, a dull red brown form clearly marked by somewhat lighter and somewhat darker markings, the main veins being also lined out; the h.w. have the basal two thirds much lighter brown. The space between the stigmata is the darkest.

He also figures *maillardi*, *l.c.* plt. 18. 3. All are in the genus *Hadena*.

None of Duponchel's figures indicate at all the woolly appearance of all the forms of the species or species.

Millière, *Icon.* (1867), plt. 84. 8, has a very fine figure of *assimilis* from a specimen sent him by its describer Doubleday. It is an extremely rich dark black-brown with marking very slightly impressed. The veins are not marked out.

He also gives, *l.c.* plt. 65. 11, a figure of *exulis*, dark brown, with a darker central shade, the veins being lined with a lighter brown, there is also a darker shade in the submarginal area. The stigmata are the lightest feature, dirty white.

Newman has two very good figures of the typical forms, but not *assimilis*.

South, *Moths B.I.* I. plt. 123, gives three good figures, 1st the Shetland *exulis* and 3rd the Rannoch *assimilis*.

Weir, *Ent.* XVII. plt. I. figs. 4-7, gives 3 very beautiful figures of the large white-lined insect taken in Unst. These lines, both the longitudinal and transverse ones are well emphasised and answer to Hampson's *maillardi* description of *diffusa*, only more extreme. Figure 4 is the small very dark uniform Rannoch form, which Doubleday named *assimilis*, and which we should call a form of *exulis*.

Variation.—Barrett says "The variation of this species abroad is extraordinary."

Barrett records a specimen of which "Its more important character of supposed distinction is the comparatively greater length and narrowness of the forewings, and their more pointed apex. Its ground colour is drab-brown abundantly marbled with umbreous and dusted with black, and its only conspicuous marking is the reniform stigma, which is distinctly edged with white in such a manner as to give it a singular resemblance to *M. brassicae*; a row of white dots which is fairly distinct between the second and subterminal lines in the figures of *maillardi* is only faintly visible in this specimen, yet recognisable under a lens; it is moreover a little smaller than the figures quoted."

Herr Leo Schwingenschuss (*Verh. z.-b.* LXXIII. (22) 1922) says that *maillardi* has a series of variations parallel to that of *monoglypha*.

Browne's notes on the 17 specimens (some bred) in the Dobrée Collection are interesting. *Descrip. Cat. Eur. Noct.* 31 (1909).

The Names and Forms to be considered are:—

oleracea, Mohr. *Isl. Nat.* 90 (1786).

[*zeta*, Tr.]

[*pernix*, H.-G.]

maillardi, H.-G. *Saml. Noct.* 833 (1834).

exulis, Lefbv. *Ann. Soc. ent. Fr.* 392, pl. 10, 2-3 (1836).

gelata, Lefbv. *l.c.*

groenlandica, Dup. *Hist. Nat. Sup.* III. 228, pl. 21, 3 (1836).

diffusa, H.-G. *Zut.* p. 9, f. 821-2 (1837).

marmorata, Zett. *Ins. Lap.* 937 (1840).

[*clandestina*, Bdv.]

cervina, Germ. *Fn. Ins. Eur.* XX. pl. 19 (1842).

[*marmorata*, H.-S. *Sys. Bearb.* II. 267, figs. 451-3 (1845).]

borea, H.-S. *l.c.* Addenda p. 55, ♂ and ♀ (1845).

assimilis, Dbldy. *Zool.* V. 1914 (1847).

poli, Gn. *Noct.* V. 187 (1852).

gelida, Gn. *l.c.* V. 196, pl. IV. 7 (1852).

[*rivalis*, Gn.]

schildei, Stdgr. *Cat.* III. ed. 172 (1901).

infusata, Schwing. *Verh. Ges. z. b. Wien.* p. 29 (1923-4).

H.-S., *Sys. Bearb.* II (1845) treats *borea*, *maillardi* and *groenlandica* as separate species well separated from one another, in the genus *Polia*. He treats *gelata* and *marmorata* as synonymous; also in *Polia*. He puts *cervina* in the genus *Neuria* and refers to *marmorata* figure as the same!! Of *exulis* he says nothing except putting it in the Synonymic List without reference.

Of these *maillardi* is large and the others small, the size of British *assimilis* from Rannoch. *Groenlandica* is the largest of the small forms.

Barrett says of *maillardi*, "That it is a variety of this species I feel no doubt," *l.c.* IV. 123.

Staudinger, *Stett. e Zt.* (1857) p. 238, dealing with the more than 400 examples obtained by him in Iceland, after enumerating the forms hitherto named gives a dozen vars.

- a. Forewings black, marbled with white; ♂ and ♀.
- b. Forewings black. central band broadly paler; ♂.
- c. Forewings variegated with black, yellow and white ♂ and ♀.
- d. Forewings yellowish, dusted with black; ♀.
- e. Forewings yellowish marbled with white.
- f. Forewings unicolorous grey, with the lines black; ♂ and ♀.
- g. Forewings unicolorous reddish; ♂ and ♀.
- h. Forewings unicolorous ochreous yellow; ♂
- i. Forewings grey, subterminal line spotted with yellow; ♂ and ♀.
- k. Forewings black, stigmata yellow; ♂ and ♀.
- l. Forewings black, stigmata white; ♀
- m. Forewings wholly black; ♂ and ♀.

He did not attach any names to these.

Staudinger said that no Noctuid known to him varied to the extent this species does, and he therefore commented on the names he found for the various forms, especially because of the possibility of error from authors mostly describing from worn examples:—

Gröndlandica, Dup. was thought to be *exulis*, Lefbv. but the latter was so worn that Dup. was doubtful as to the identity.

Gelata, Lefbv. was recognised by most authors quite certainly as the ♀ of *exulis* and therefore should fall although published prior to *gröndlandica*.

Borea, Boisd. is only a Catalogue name with no description.

Cervina, Germ. is only an *exulis*.

Cervina, Evers. (H.-S. figs. 163, 164), [= *leineri*] is not the same insect as *cervina*, Germ.

Diffua, Hb.-Gey. obtained from Grönland by Sommer, with some doubt belongs here.

All species in Guenée under *Crymodes* except *sommeri* belong here.

Both *poli* and *gelida* can belong only here.

The *gröndlandica*, Frey, belongs here certainly, but the *gröndlandica*, Zett., I place here with a ?, since its description is that of *sommeri*.

The *oleracea*, Mohr., can only be placed here.

Wocke in an article on Norwegian Lepidoptera, *Stett. ent. Zt.* 183 (1864) discusses the possibility of *maillardi* and *exulis* being the same species.

Hoffmann, in an article on the Shetland Islands, expressed the strong opinion that *zeta*, Tr., *pernix*, H.-G., *maillardi*, H.-G., and *exulis*, Lef., were one and the same species.

The Rev. Dr. Walker, *Proc. Ent. Soc. Lond.* (1890) XXXIV. exhibited a large number of *Crymodes exulis* picked from more than 350 specimens obtained by himself in Iceland. He pointed out the forms comprised, as follows—

Marbled, dark marbled, light brown marbled, brown marbled, dark, dark one-spot, light brown one-spot, marbled one-spot, marbled two-spot, brown white-patch, light brown, dusky marbled, and brown. He stated that the brown forms predominated.

Smith *Cat. Noct. Bor. Am.* 137 (1893) says "In the Jardin des Plantes at Paris is a long series of specimens separated out by Guenée and containing types of his names. They all refer to one species." He refers to *exulis*, *gelata*, *groenlandica*, *marmorata*, *diffua*, *gelida*, *poli* and *borea*.

Meyrick, *Hand.* 123 (1896) has genus, *Caradrina*; in *Rev. Hand.* has the genus, *Hadena*. In his description he describes *exulis* but puts *assimilis* as synonymous, which it cannot be as the latter is very dark and almost unicolorous.

Stdgr., *Cat.* IIed. 172, classifies *exulis* with the prior described *maillardi* and describes a form *schildei* from Finland as "Magnitudine *maillardi* al. ant. rufescenti—brunneis." He considers *diffua*, Hb. *Zut.* p. 9, fig. 821-2 (1823) as one of the forms, of which *exulis*, Lef. is a synonym, with 9 other forms *gelata*, *groenlandica*, *cervina*, *marmorata*, *assimilis*, *gelida*, *poli*, *oleracea* and *borea*. In his *Cat.* IIed. (1871) Stdg. had already united *maillardi* to *exulis*, putting "Darwinian form" with a query.

Spuler omits *exulis* altogether. He has *maillardi* and *zeta-pernix*. He treats *diffua* as a species.

Rebel, *Berge. Schm. Buch.* p. 198 (1909) has *maillardi* and *diffua* (*exulis*). His dates are *diffua*, Hb. (1823), *maillardi*, H.-G. (1826). He notes that many authors consider *diffua* as the northern form of *maillardi*.

Hamp. (1908) considered *exulis* as a form of *maillardi*, Hb.-G. He notes:—

maillardi. A large fuscous brown form without streaks on veins of forewings.

exulis. A small grey brown form without pale streaks on veins of forewings.

schildei. A large red brown form.

assimilis. Much blacker.

groenlandica. A small pale grey-brown form without streaks on veins of forewings. Hamp. describes the species from Hb.-Geyer's fig. *Zut.* p. 9, fig. 821-2 (1837).

difflua. Forewing olive brown irrorated and suffused with black-brown, the veins with pale streaks.

Warr.-Seitz *l.c.* (1911), considered *oleracea*, Mohr. (nec L.), *gelata*, Lef., *groenlandica*, Dup., *difflua*, Hb.-G., *marmorata*, Zett., *borea*, Bdv., *cervina*, Germ., and *poli*, Gn. as synonyms of *exulis*, Lefbvr. He says "Always smaller than *maillardi*, Hb." which he treats as a separate species. He also treated *zeta*, Tr., with its forms *rivalis*, Gn., *pernix*, Hb.-G. and *zetina*, Stdgr., as a separate species.

Culot, *N. et. G.*, I(1). 153, in dealing with *maillardi*, refers to the great confusion around this species, of which he gives a very good figure on pl. 27. The *exulis*, Lefbvr. he holds as the same as *difflua*, Hb. and strongly holds that it is quite a different species from *maillardi*. He refers to the eleven different designations of forms of this species but says he dare not unravel the difficulties with his paucity of material. He figures *groenlandica* from the type specimen of Dup. in the Oberthur coll. and also *borea*, Bdv. from the two type specimens, and a recent very pale example of *exulis* from Lapland.

Further, he expressly excludes *zeta* (*pernix*), which is so often confused with *maillardi* (*exulis*), since he has never seen an example of *pernix* of the yellow shade which "seems to characterize" *maillardi*.

In his figures Culot depicts *maillardi* of large size (27·17), *groenlandica* somewhat smaller (27·18), *exulis* (28·1·2), *borea* (28·3·4), *exulis* (28·5) all of small size.

Tutt dealt with the *exulis*, Lefbvr., *gelata*, Lef., *groenlandica*, Dup., *marmorata*, H.-S. (= *cervina*, H.-S.) (not the *marmorata*, Zett.), *assimilis*, Dbldy., *gelida*, Gn., *poli*, Gn., and *borea*, H.-S. (*borea*, Bdv. was without description). The *borea*, Gn. is different from the *borea*, H.-S., teste Tutt, *Br. Noct.* I. 121. The form *cervina* was described by Germar and not by H.-S.

difflua, Geyer, *Zut.* 9 (1837).

FIGS.—*l.c.* 821-2.

ORIG. DESCIP.—Hamp. describes the fig. of which he gives a copy, *Lep. Ph.* VII. p. 424, fig. 70.

"Head and thorax dark reddish brown mixed with grey; tarsi blackish with grey wings; abdomen deep seal-brown. Forewing olive brown irrorated and suffused with black brown, the veins with pale streaks; sub-basal line represented by black striae from costa, and cell definitely whitish on outside; antemedial line black defined by pale brown on inner side, oblique, waved, angled inwards to white points on the veins; claviform slightly defined by black, elongate and acute at extremity; orbicular and reniform greyish or olive-brown with slight whitish annuli defined by black; the former rounded or oblique elliptical; traces of a waved medial line; post-medial line defined by pale brown on outer side, bends outwards below costa, then dentate and produced to white points on the veins, excurved to vein 4, then oblique, some white points beyond it on costa; subterminal line pale brown defined on inner side by small, somewhat dentate

blackish marks, excurved below vein 7, excurved and minutely waved at middle; a terminal series of slight black lunules; cilia ochreous white with blackish line near base and blackish tips." Labrador, Iceland, Shetland.

maillardi, Hb.-G. (1834) *Samml.*

FIG.—l.c. 833.

ORIG. DESCIP.—Described from the figure (Hy.J.T.). General ground colour a dark leather brown slightly tinged with rufous. The four usual transverse lines are all band-like, narrow, lighter than the ground, a light brown or very dirty white. The basal line is incomplete, poorly marked with jet black on the outer side, general direction oblique and zigzag. The second line also oblique with very irregular dense black projections between the veins emphasizing the crenulation on the outer side. The transverse line outside the stigmata is parallel to the outer margin with a sharp deflexion inwards to the costa; the crenulations of it are inwards and each is surmounted by a dense black wedge-shaped spot: the outside is not defined except by colour shade. The waved line roughly parallel to the hind-margin is zigzag with a slightly developed W, edged inwardly by a very uniformly even jet black broad line. In the clear space of somewhat light ground between the two last lines runs a row of very uniform white dots, the last on the costa being accompanied by one on each side. On the outer margin there are a series of stumpy black triangles each touching at their bases, with a white spot at each juncture. The fringe is the same colour as the wing ground. The reniform stigma is marked by a narrow band of lighter colour emphasized inside and outside by a more or less black line. The orbicular is irregular and difficult to trace. The claviform is marked by a jet black line, it rests on the 2nd line but is not further indicated by colour difference. A few veins are marked out in black, one below the costa somewhat conspicuously. Above the reniform there are two small blotches on the costa, a black and a white one. The hindwings are dirty grey, shading darker towards the hind margin, but without further differentiation.

marmorata, Zett. *Ins. Lap.* 937 (1840).

ORIG. DESCIP.—“*Alis anticis griseo fuscoque variegatis, maculis ordinariis strigaeque postica undulata pallidis, serie punctorum nigrorum intra marginem apicalem; posticis fuscis.*” Lapland.

He further states that *Hadena leucophaea*, Hb. and *H. gelata*, Lefbvr. (*Ann. Fr. X.* 393) are related and similar.

Of *groenlandica*, Lefbvr. he says “*Alis anticis cano nigroque variis, strigis 3 dentatis distinctioribus albis, maculis ordinariis obsoletis; posticis fuscis, basi dilutioribus.*” Greenland. This description seems to refer to an *exulis-maillardi* form as usually accepted.

var. *cervina*, Germ. *En. Ins. Eur.* XX. pl. 19 (1842).

ORIG. DESCIP.—“Head, thorax and abdomen grey. Fore-wings fawn-coloured irrorated with fuscous black atoms, traversed by grey veins irrorated with black. The transverse waved line near the base and the other before the middle grey, on the outer side bordered with black lines. The stigmata grey irrorated fuscous, surrounded with a black shade. Two parallel lines, dentate, transverse, curved, grey,

bordered on the inside with black lines across the wing before the outer margin. The hind-marginal black line separates the wing from the fawn-coloured cilia. The under surfaces of the forewings are cinereous, the reniform stigma and the two transverse lines before the outer margin are light in the middle." "Hindwing grey, fuscous at the margin, the waved transverse line is obsolescent on the much paler central area; cinereous below." Iceland.

ab. *infuscata*, Schwing. *Verh. z.-b.* LXXIII. (29)(1922).

"In a female *maillardi* caught (ebendort) in a similar locality the whole of the forewing is suffused with blackish, and no other marking can be seen except the outer whitish surround of the reniform and the distinctly visible waved line. It is comparable to the similar aberration of *monoglypha*."

ab. *schildei*, Stdgr. *Cat. Lep. Pal.* 172 (1901).

ORIG. DESCIP.—"Magnitudine *maillardi* al. ant. rufescenti-brunneis."

Pachetra leucophaea, View.

Pachetra, Gn. (1852) New., Barr., Hamp., South. [*Melanchra*, Hb. (1822) Meyr.: *Manestra*, Hb. (1822) Stdgr., Splr., Cul.: *Heliohobus*, Bdv. (1829) non descrip.: *Hadena*, Schrnk. (1832) Tr., Err.] *leucophaea*, View. (1790), Schiff. (1775) = *fulminea*, Fb. (1776) = *sagittifera*, Hufn. (1766).

On account of the feathered antennae the early authors classed this species as a *Bombyx*.

Tutt did not take the original description which was in Schiff. *Verz.* 82 (1775), where it is placed among those species "with streaked larvae on *Achillea millefolium*, the imago upper wings greyish with white lines." "The thousand leaf noctua." A wholly inadequate description but Illiger, *Verz.* IIed. 271 (1801) refers it to the *leucophaea* of Bork. and of Brahm, to the *B. fulminea*, Fb., and the *B. vestigialis*, Esp. The *Verz.* is now considered to be the last work published in 1775.

Tutt noted that the name *fulminea*, Fb., *Ent. Syst.*, III(1). 484 (1793) was this species, but again did not trace the name back through the *Mantissa* and *Species Ins.* to the *Genera Ins.* p. 282, (1776).

[Fabricius placed *fulminea* in *Bombyx*. The *fulminea*, Scop. in the *Noctua* was the prior name of *paranymphea*.]

Hübner's *Text.* p. 186 (1805—) gives references to Schiff. *Verz.* (1775), to *fulminea*, Fab. and *ravida*, Esp.

ORIG. DESCIP. (of *fulminea*)—"Alis incumbenibus griseo fuscoque variegatis, thorace antice albo striga nigra."

"Antennae pectinatae ferrugineae. Thorax griseus antice albus striga tenui nigra. Ad latera utrinque lunula alba. Alae anticae basi albidae lituris nigris, tunc griseae, in medio fascia lata fusca, quae antice posticeque a striga undata alba includitur. Maculae ordinariae albidae in hac fascia. Alae apice griseae striga undata nigra. Posticae griseae."

Hamps. *Lep. Ph.* V. 203 (1905) attributes *leucophaea* to Schiff.

(1775) and relegates *fulminea*, Fb. (1776) to synonymy. Warr.-Seitz, on the other hand, *Pal. Noct.* III. 79 (1909) ignores the inadequate description of Schiff, and attributes *leucophaea* to View. (1791), adopts *fulminea*, Fb. (1781) and relegates *leucophaea* to synonymy. Illiger in *Verz. Hied.* 1801, p. 271 refers *leucophaea* to the *fulminea* of the *Ent. Sys. emend*, III(1). 184 (1793). [III(2). given in text is an error.]

Werneberg, *Beitr.* I. 211 (1864) refers the *vestigialis*, Hufn. to *valligera*, Tr.; the *sagittifera*, Hufn. to *leucophaea*, Tr.; the *leucophaea*, Schiff, and the *Bombyx fulminea*, Fb. to *sagittifera*, Hufn.; the *Bombyx vestigialis*, Esp. to *sagittifera*, Hufn.; the *ravida*, Esp. to *sagittifera*, Hufn.; and in all cases *leucophaea*, to the same.

Hufnagel's description of *sagittifera* is as follows.—“The arrow bearer. Brownish grey with sundry black markings, some of them are the shape of an arrowhead. 2nd size. In the grooves on fences and tree trunks. June-July. Rare.” [Copied from Werneberg. *l.c.* 252]. This seems to apply to *leucophaea* and if so is the prior name.

Tutt *Brit. Noct.* I. 121 (1891); IV. 108 (1892): Barr. *Lep. Br. Is.* IV. 145, plt. 153 (1897): Sldgr. *Cat. Hied.* 155 (1901): Hamp. *Lep. Phal.* V. 203, fig. 27 (1905): Splr. *Schn. Eur.* I. 168, plt. 36 (1905): South *Moths Br. I.* I. 257, plt. 158 (1907): Warr.-Seitz *Pal. Noct.* III. 79, plt. 19ef. (1909): Culot *Noct. et Geom.* I(1). 97, plt. 16, fig. 11 (1909-13).

Esper, *Abbild.* on plt. LIII., figs. 4-5, gives two recognisable figures of a form of *leucophaea*, which he calls *vestigialis* under the impression that it was the *vestigialis* of Hufnagel, *Berlin Mag.* II. p. 422, and of Rott. *Naturf.* VIII. p. 107, but as Bork. points out *Schn.* IV. 411, Hufnagel's insect had only the size of *chrysorrhoea* and the marking was not that of *leucophaea*. Esper on plt. CXLV. fig. 1 depicts an insect which he calls *ravida*. There seems little doubt that it is a form of *leucophaea*. In this Werneberg, *Beitr.* II. 45, agrees. Bork. *l.c.*, IV. 412 says that this figure is that of a *leucophaea*.

Ernst and Engr., *Pap. d'Eur.* V. fig. 245 (1786) give 4 figures of the imago: *c*—a darkish banded form possibly representing *ravida*; *e*—a small dark form, possibly referable to *bombycina*; *f*—a very grey form with numerous light bluish slate-grey areas; *g*—a rather rich brown form but the reniform stigma encircled with white (the most stable and emphasized feature in all examples) and numerous black features including the next stable “arrows.”

Hübner's fig. 80 (1802) has a central band of purplish tint. Hübner's (Geyer) fig. 817 (1834) also has the purplish tinge, but is a figure of very bad shape.

Hübner's description of fig. 80 runs, “Bluish-grey, brownish shaded; the forewings marked with pale central spots and waved lines, also a black spot near and similar small streaks. The hindwings shade ashy grey marked with a pale line. The body similarly ashy grey.” A poor description.

Stephen's fig. *Ill.* plt. XXIV. (1829) is, absolute rubbish in my copy. He calls it a fine example!

Dup. *Hist. Nat.* VI. plt. 90, 6 (1826) has a very good figure but small, the veins are well emphasized in white; plenty of “arrows.”

Freyer, *Neu. Beitr.* (1842) has two good figures on plt. 382, in both of which the claviform is unusually indistinct.

Newman, *Brit. Moths.* 295 (1871) has a very good black and white figure.

Barrett, *Lep. Brit. Is.* IV. plt. 153, gives several good figures of light and dark forms of both sexes.

Hamps., *Lep. Phal.* V. 204, fig. 27 (1905) has a good black and white figure.

Spuler, *Schm. Eur.* I. plt. 36, 8 (1905) has a very fair figure as to marking but the general colouring is brown suffusion, no grey or black, nor are the "arrows" distinct.

South, *M.B.I.* I. plt. 128, 1 (1907) gives a very good figure of a somewhat dark British specimen.

Warr.-Seitz, *l.c.* gives seven figures; plt. XIXef. (1909), ♂ and ♀ *fulminea*, *vestigialis*, *bombycina* ♂ and ♀, *grisescens* and XXa. *pyrenaica*. The colour is not at all good, otherwise they are good figures.

Culot, *N. et G.* I(1). plt. XVI. 11 (1909-13) has a good figure.

Of the variation Barrett says—"Usually not very variable." This is true of our British specimens more or less, but from examination of the figures of many authors and the examination of various specimens from British and continental sources no two specimens seem to agree. The innumerable minor differences in marking are extreme although the texture, basal colour and emphasis agree in the main.

Barrett records a specimen "having the forewings remarkably white, with the claviform stigma as usual, large and dark, but the other markings only margined or faintly indicated." This may be the *incana* of Millière.

The Forms and Names to be considered are:—

sagittifera, Hufn. *Berlin Mag.* II. 422 (1766).

fulminea, Fb. *Gen. Ins.* 282 (1776-7).

f. *vestigialis*, Esp. *Abbild.* III. 270, plt. 53 (1782).

f. *ravida*, Esp. *Abbild.* IV(2). 462, plt. 145 (1789).

leucophaea, View. *Tab. Verz.* II. 23 (1790).

ab. *bombycina*, Evers. *Bull. Soc. Imp. Mosc.* (1847), 78, plt. 6.

ab. *incana*, Mill. *Cat. rais. Sup.* II. 17 (1875).

subsp. *pyrenaica*, Obthr. *Ét. Ent.* VIII. 50 (1884), IX. plt. 3, f. 10.

ab. *grisescens*, Warr.-Stz. *Pal. Noct.* III. 79, plt. 19f, (1909).

ab. *brunnea*, Reb. *Berge.* 178 (1909).

ab. *diluta*, Reb. *l.c.*

ab. *conjuncta*, Hirschke., *Verh. Ges. Wien.* LX. 416 (1910).

ab. *melaena*, Hartw. *Ent. Zt.* XXVI. 187 (1910).

subsp. *syriensis*, (Hamp.) Strand. *Cat. Lep. Phal.* V. 204 (1905): *Arch. Natg.* LXXXII. A. 2, 2 (1917).

ab. *nigra*, Wagn. *Int. Ent. Zt.* XXIV. 476 (1931).

race (ssp. ?) **britannica**, nov.

Tutt deals with (1) *leucophaea*, (2) *fulminea* in pt., (3) *vestigialis* speckled with ochreous, (4) *ravida* with with central area red, (5) *bombycina* a small form, (6) *pyrenaica* the melanic subsp.

Eversmann *Bull. Mosc.* plt. V., figs. 1-2 (1847), under the name

bombycina, ♂, gave a figure which much resembles *typica* in size, marking and shape. The wings are short, antennae well pectinated, light markings conspicuously accompany every other marking; hindwings do not show the differentiation of marginal and discal areas to any degree; there is also a dusky line midway across the disc of hindwing.

In *l.c.* (1856) plt. II., fig. 5, has markings similar to the 1847 fig. but all quite narrow lines and in some cases suppressed to mere traces of those of the previous fig. The hindwing has a decidedly dark marginal area and a clear light discal area.

Esper remarks re his fig. called *ravida*, *Abbild.* IV. plt. 145 on p. 462, IV(2). that it has almost wholly the markings of his *vestigialis* on plt. 53 and that Bork. calls it a var. of *vestigialis*. "The ground colour is a mixture of brown, grey and blackish, the stigmata are so pale and slightly marked that the white line with which they are edged can scarcely be seen." But the black submarginal streaks and markings are so run together as to form a very irregular narrow band.

ab. *incana*, Mill. *Cat. rais. Sup.* II. 17 (1875).

ORIG. DESCRIP.—"The imagines reared from St. Martin Berthemont are always very light."

subsp. *pyrenaica*, Obthr. *Ét. Ent.* VIII. 50 (1884).

FIG.—*l.c.* IX. plt. 3, f. 10.

ORIG. DESCRIP.—"A very remarkable local variety and very constant, distinguished from the ordinary type of France by the obscure coloration of its wings. It seems that the *leucophaea* of Cauterets is entirely covered with a blackish slaty grey colour, upon which only the black marking and the white circle which surrounds the orbicular and reniform stigmata stand out."

ab. *griseus*, Warr.-Seitz *Pal. Noct.* III. 79.

FIG.—*l.c.* plt. 19f. (1909).

ORIG. DESCRIP.—"Rather smaller than typical *fulminea*, dark grey suffused with fuscous, without any admixture of brown or ochreous; the upper stigmata grey with white outlines, the claviform black; the underside is whitish powdered with grey; the cell spots large; an outer line on both wings." Calabria, Lila Mts.

ab. *brunnea*, Rbl. *Berge.* 178 (1909).

ORIG. DESCRIP.—"Forewing almost unicolorous brown mostly with the orbicular and reniform stigmata defined with white."

ab. *diluta*, Rbl. *Berge.* 178 (1909).

ORIG. DESCRIP.—"Much paler than the typical form, the forewings white-grey, with obsolescent dark markings, only the claviform stigma is dark, generally also the marginal area towards the waved line."

ab. *conjuncta*, Hirschke. *Verh. Ges. Wien.* LX. 416 (1910).

ORIG. DESCRIP.—"From the lower margin of the reniform runs a broad white streak to the lower part of the orbicular and makes a complete junction of the two stigmata here." A ♀ was found at Zuckmantel in Silesia sitting on a birch.

ab. *melaena*, Hartw. *Ent. Zt.* XXVI. 187 (1913).

ORIG. DESCRIP.—“Distinguished by the absence of the white brighter markings on the upper wings; the orbicular, reniform and claviform stigmata are dark like the rest of the wing and have in place of a white or light margin a deep black one.” Brunswick.

ab. Hoffm. and Kloss. *Schn. Stierm.*, 382 (1914).

ORIG. DESCRIP.—“Many specimens are noted with varied longitudinal markings, very dark and pale white.”

race *syriensis*, Hamp. (Strand) *Cat. Lep. Ph.* V. 204 (1904) [*Arch. Naturg.* LXXXII. A. 2, 29 (1917)].

ORIG. DESCRIP.—“Hindwings white, the veins only tinged with brown.”—Syria.

ab. *nigra*, Wagn. *Int. Ent. Zt.* XXIV. 476 (1931).

ORIG. DESCRIP.—“In Anatolia the form of *leucophaea* is *bombycina*, Ev.” Among those taken was “One example obtained on May 23rd a ♂ is almost uniformly dark (blackish) slate grey.”

race (ssp. ?) ***britannica***, nov.

ORIG. DESCRIP.—Barrett says *l.c.*, “The white ground colour appears to be more especially visible in our native specimens, those from abroad having the ground colour much tinged with pale umbreous or smoky-brown.”

“British examples are usually of lighter ground.” South.

There appears to be at least a racial, if not a subspecific distinction, in our British examples.

In fact, a close examination of our British examples seems to show that in all the lighter shades of this very variegated insect there is a whiter element particularly in the hind marginal area. The markings seem to show a greater contrast between the darker and lighter. In British examples there are always some veins strongly emphasized whereas in continental examples the light veins are extensively missing. I think that one might venture to call this race (ssp. ?) ***britannica*** from its isolation and its general impression.

Cerigo matura, Hufn.

Cerigo, Steph. (1829) Gn., Newm., Barr., Obthr., South, Cul. [*Polia*, Treit. (1816-25) H.-S.: *Thalophila*, Hb. (1822), Splr., Hamps., Warr.-Seitz: *Caradrina*, Hb. (1822) Meyr.: *Celaena*, Steph. (1829) Stdgr.] *matura*, Hufn. (1766).

Meyr., *Hand.* 124 (1896) places it last in his omnibus genus *Caradrina*, and immediately followed by *Senta maritima*. In the Revised Edition, p. 77 (1927), *matura* is retained in *Caradrina* but is immediately followed by *Mania maura*.

Polia, Tr. is a non-descript until 1825.

Werneberg, *Beitr.* I. 219 (1864) gives *texta*, Tr. as the *matura*, Hufn.; the *cytherea*, Fb. as *matura*, Hufn. (p. 429); the *texta*, Esp. as *matura*, Hufn.; and the *texta* of View. as *matura*, Hufn.

Tutt *Brit. Noct.* I. 123 (1891) : Barr. *Lep. Br. Is.* IV. 342, plt. 174, 3 (1897) : Stdgr. *Cat.* III ed. 169 (1901) : Splr. *Schn. Eur.* I. 187, plt. 39 (1905) : South *Moths Br. Is.* I. 269, plt. 128 (1907) : Hamp. *Lep. Phal.* VII. 679, fig. 176 (1908) : Warr.-Seitz *Pal. Noct.* III. 199, plt. 44k. (1911) : Culot *N. et G.* I(1). 143, plt. 26, 4-5 (1909-13).

Ernst. and Eng., *Pap. d' Eur.* VII. 33, fig. 430, (1790) give three pictures all quite good, which they identify as forms of *texta*, Esp. They say that Esper's text has not yet appeared (1790).

Treit, *Schn. Eur.* X(2). 41, (1835), speaks of the larva being like that of *popularis* and in his description of the imago compares it with the same species.

Hübner named both figs. 109 and 548 as *connexa* but subsequently identified them as the *texta*, Esp. Revisers since Hüb. have agreed to consider fig. 548 as *connexa*. But fig. 109 is certainly not "obscure" in its marking and hence cannot be allotted to the obscure *texta* form, but may be considered as representing the typical form *matura*.

Dup. *Hist. Nat.* V. 147, plt. 57 (1824), has a good figure of a non-variegated form, brownish grey, the central area darker and obscure red grey.

Frr. *Neu. Beitr.* III. 91, plt. 257 (1839) has a very good figure of the variegated form *cytherea* under the name *texta*.

Splr. *Schn. Eur.* I. 187, plt. 39 (1905), gives a good figure of *matura* the more uniform dark brown form.

South, *M.B.I.* I. 269, plt. 128 (1907), gives 2 very good figures.

Hamp. *Lep. Phal.* VII. 579 has a good black and white figure.

The fig. *matura* in Warr.-Seitz, plt. 44i is a highly variegated form, which is not typical but a much emphasized *cytherea*, Fb. The fig. *texta*, plt. 44k is a less variegated form much nearer to the typical form of Hüb. 109.

Culot gives a good figure of a uniformly dark brown form with a lighter inner line and the outer line white except the near costa portion. The rest of the markings obsolescent. The reniform and orbicular are indicated by slight black outlines without any differentiation of centres and are much more obscure than in the form *texta*, Esp. As a well authenticated form this may be called f. or r. (not subsp.) **obscura**.

Obthr. *Bull. S. ent. Fr.* (1908) points out that this Geneva form is local and this statement Culot confirms.

Barrett *Lep. Brit. Is.* IV. plt. 174, figures a ♂ with outer, inner, and submarginal lines clear white; a ♀ with inner line obsolescent, outer and submarginal lines indistinct, and lighter brown between outer and submarginal lines; both rather rich brown but *not* red.

Variation.—Barrett says "Usually very little variable, except in the depth of the yellow colour of the hindwings; but in Ireland Mr. Kane finds it more so, some examples being of a dark lustre-brown with pale lines, the stigmata ferruginous, and the band of the hindwings more than usually dark; also others of brighter colour, but with the nervures beyond the middle very pale."

Barrett records one "with the forewings unicolorous dark yellow-brown shaded with dull grey."

The names and Forms to be considered are:—

- matura*, Hufn. *Berlin Mag.* III. 414 (1766). Hüb. *l.c.* 109 (1802).
ab. texta, Esp. *Abbild.* IV. 185, plt. 108, 5-6 (1787).
f. cytherea, Fb. *Ent. Sys. emend.* III(2). 57 (1794).
 ♀ *prospicua*, Haw. *Lep. Brit.* 160 (1806-10) nec Hb.
ab. connexa, Hb. *Samm. Noct.* [109 (1802)] 547-8 (1808-18).
 Text. 179 (1805 ?—).
ab. amathusia, Rmbr. *Ann. Soc. ent. Fr.* 119 (1870). *l.c.* plt. 15 (1871).
r. provincialis, Obthr. (*Culot*) *Noct. et G.* I(1). 143, plt. XXVI. (1909-13).
r. iberica, Obthr. (*Culot*). *l.c.*
ab. pallida, Rbl. *Rev. Lap.* XXIII. 109 (1916).
ab. infusata, Hoffm. *Verh. zool.-bot. Ges. Wien.* LXIX. (139) (1919).
r. (ssp. ?) sanguinea, Dnhl. *Mitt. Münch.* XIX. 108 (1929).
r. (ssp. ?) variegata, Dnhl. *l.c.*
f. or r. (not ssp.) obscura, nov.
 Tutt dealt with (1) *matura* the brownish grey (not red) form ; (2) *connexa* the reddish form ; and (3) *texta*, the obscure form of Esp.

ab. texta, Esp. *Abbild.* IV. 185, plt. 108.

Tutt describes the figure 5 of Esper thus "Anterior wings almost unicolorous, dull purplish brown with a dark streak parallel to the costa from base to reniform, and two dull basal lines, no orbicular but distinct reniform ; a dull wavy line parallel to hind margin. Hindwings yellowish with a dull purplish grey hind margin." *Brit. Noct.* I. 124 (1891).

This description is far from correct. The ground colour is not uniform. The outer marginal area on both upper and undersides is much paler than the rest of the wing. The reniform is circular in shape. The outer line is wide and white, and instead of going to costa is continued completely around the so called reniform. There is a black line parallel to the hind margin, limiting the light marginal area on the inner margin, with still lighter chevrons on the outside, and there are various suppressed bluish markings accompanying the other marking. The hindwings are as near white as can be.

The male, fig. 6, much more resembles a form of *matura*, than does fig. 5. It can be recognised as a *matura* but very obscure with no trace of white.

Steph. uses the name *texta*, Esp. for this species, *Ill.* II. 107 (1829). In his *Syn. Cat.* II. 64, he gives *prospicua*, Haw. (nec Hb.) as the name of the ♀, but omits all mention of it in the *Ill.*

Warr.-Seitz *Pal. Noct.* III. 199, treats *cytherea* and *connexa* as synonyms and recognises only the dull obscure form *texta*.

Esper's description reads, "Alis superioribus fuscis albedo-nebulosis, stigmatibus ordinariis, striis tribus flexuosis albis nigro inductis : inferioribus luteis, margine lato fusco."

With such diversity of description and figures all one can say is, as Tutt said, that *texta* is the name for all the very obscure specimens.

Hübner, *l.c.* fig. 109, *connexa*, is an excellent figure as to marking, shape, size and hindwing colour but the red is only a faint shade and by no means dominant as in the copy Tutt used (*Ent. Soc.* copy ?). Fig. 548 is not nearly so good a figure. The lines are not whitish but dull orange, the base of forewing is very distinctly orange as well as

the inner margin between the inner and outer transverse lines. The reddish suffusion is much more apparent and tending to orange and the transverse area between the outer line and the waved line is blackish brown, whereas in the fig. 109 the blackish brown covers only the inner half of the area. It certainly portrays a different form.

Hüb. *Text.* p. 179, calls both figs. 109 and 548 *texta* instead of *connexa* as on the plates, and gives Esp. as reference. His description runs "Greyish dusky: the wings marked with varied pale central spots and waved lines: the hindwings pale, clay yellow, bordered blackish grey; the body the same." An inadequate description certainly, as the figures show different forms.

f. cytherea, Fb. *Ent. Syst. emend.* III(2). 57 (1794).

Tutt omits the fuller description of *cytherea*, Fb. and does not include it after saying it represents a "variegated form." The full description is as follows:—

"*Alis incumbentibus variegatis: striga alba, posticis flavis: margine fusco.*—*Alae anticae cinereo fuscoque variae maculis in medio ordinariis. Pone maculas striga distincta, undata, alba. Posticae flavae margine fusco. Subtus anticae obscurae, posticae pallidae.*" *Habitat in Suecia.*

That is, a form variegated with whitish or white markings.

Haw., *Lep. Brit.* p. 160 (1806-10), describes a species, "*Alis subcinereis, obsolete strigatis, posticis luteis fimbria angusta fusca submarginali*" under the name *prospicua*, and says that he has seen it. Subsequently, p. 162, under *cytherea*, after again seeing it he supposes it will prove to be a large variety of this species, as it does not possess a large lunar spot on the underwing.

Gn. *l.c.* says that the *prospicua*, Haw. *l.c.* is the ♀ of *matura*.

Rambur, *Ann. Soc. ent. France* (1870) p. 319 describes at great length an insect under the name *amathusia*, "a little larger than *cytherea* which it much resembles." He says that he has compared it with figures of *vitalba* (= *italba*) in H.-S. and Bdv., etc., but the differences were very noticeable.

It differs from *cytherea* by the inner line having three teeth, the costal one being bifid; the outer line sinuate, not dentate as in *cytherea*, strongly white, bordered by a black line and bent outward just on the inner margin; the submarginal line badly expressed, the white dots being scarcely traceable; the band of the hindwing wider and extended along the costa above and below; the hindwing very pale yellow almost white. Perpignan, France ♀.

The following year the insect was figured by Mabille, *Ann. Soc. ent. Fr.* (1871) pl. 15 f. 8, with the comment that from the description and figure it could not be *vitalba*, but was very near *matura*, Hufn.

Vitalba is exclusively a Sicilian and Algerian insect. *Amathusia* occurs only in Spain and S. France.

Stdgr. *Cat. III* ed. (1901), Hamps. *Lep. Phal.* VII. (1908), Warr.-Seitz *Pal. Noct.* III. all consider and treat *amathusia* as a *vitalba*, Fr. Culot treats *amathusia* as a species but very near *matura*, Hufn.

Splr. treats *amathusia* as a separate species but his figure is probably a figure of *vitalba* as it is too much like *popularis* and does not agree with that of Culot nor with *iberica*, Obthr.

The original fig. of *vitalba*, Fr. Neu. Beitr. II. 49, plt. 124, 3-4 (1834) gives not the slightest suggestion of *matura*. The text refers to the strong likeness to *popularis* and to *typica*.

Oberthür in 1908 *Bull. Soc. ent. Fr.* p. 291, says "*Vitalba* is a species quite distinct and well separated from *cytherea*. *Amathusia* has nothing in common with *vitalba* from a specific point of view, and it is necessary to correct the error in the German Cat. *Amathusia* is an extreme albinistic and pale reddish expression of *cytherea* of which the most obscure form which I know occurs near Geneva." He goes on to record that Powell had just rediscovered it (*amathusia*) at Illesur-Jet, and that all intermediates occur among the 200 odd *cytherea* before him.

r. provincialis, Culot, *Noct. et G.* I(1). 143 (1909).

FIG.—*l.c.* plt. XXVI. 5. Obthr. *Études*. IX. plt. 3, no text.

ORIG. DESCIP.—"Characterized by very neat markings and a great diversity of tints which give the forewings a marbled appearance. A suggestion of a southern race." Digne.

Obthr. fig. is a very good black and white, neither dark nor light. The darkest lines are, the outer margin of the inner transverse line and the outer boundary line of the basal side of the reniform. The chevrons are complete in number and dark. The inner line (narrow band) is terminated on both costa and inner margin by two strong black dots.

r. iberica, Obthr. *Lep. comp.* III. plt. 27, 140 (no descrip.). Culot *l.c.*, plt. XXVI.

The fig. is rather small for *matura*. Hindwing very dull worn look, v. pale dirty straw colour. The forewing has paler veinings and outer line. The inner line very strongly(2) toothed. Ground colour brown of various light shades. Chevrons black and long all cut asunder by the light submarginal transverse line. A light cloud before the apex of wing.

A comparison of Culot's figure with the figures of *vitalba* and *amathusia* shows that it is much nearer to the latter than to the former. Lhomme, *Cat. Lep. France* p. 264, includes *amathusia* and *iberica* as forms of *matura*, but with the reservation that they may belong to a distinct species.

ab. pallida, Rbl. *Rev. Lep.* XXIII. 109 (1916).

ORIG. DESCIP.—"A few specimens had pale grey, slightly marked forewings and whitish-yellow hindwings with only light grey traces of the dark marginal band. These specimens agree with the *ab. pallida* (Bang-Haas *in lit.*). [I am indebted to the kindness of Dr. Zerny for this description.]

ab. infumata, Höf, *Verh. Ges. Wien.* LXIX (189) 1919).

ORIG. DESCIP.—"The yellow black bordered hindwings in normal coloured examples, are here unicolorous russet brown, somewhat as in *tragopogonis* and this darkening shows itself correspondingly on the underside." Rohrwalde, Vienna.

race (subsp. ?) *variegata*, Dnhl., *Mitt. Mun.* XIX. 108 (1929)

ORIG. DESCIP.—“Very variegated; black-brown markings with grey to grey-yellow ground, often with a purple suggestion. Markings very emphasized, the stigmata are especially very prominent and the edging of the outer transverse line, chiefly in the lower curve, distinctly white. Between the strongly emphasized veins in the outer area there are fine white streaks. Often the central area is somewhat darkened and the blackish chevron (claviform?) follows along vein V. The yellow hindwings are light, fresh pale yellow, to more whitish yellow. The dark margining is sharply defined.” Mts. of Central Italy.

race (subsp.?) *sanguinea*, Dnbl. Mitt. Münch. XIX. 108 (1929).

ORIG. DESCIP.—“In the lower situations, particularly in the Campagna Romana *variegata* was supplanted by a very dark, intensively violet-red suffused form, which here and there also flies with the above named form (*variegata*). In this especially large form the dark elements of the marking are quite ordinary not more emphasized, while the paler spots are no whiter, but appear rosy-red, especially so the whole of the stigmata. Below the cell, also across by the reniform lies a rosy-red mark. The yellow of the hindwing is much duller than in *variegata* with not so much gloss; the band on the outer margin varies in breadth and considerably in the depth of the suffusion.”

Neuronia popularis.

Neuronia, Hb. (1822), Meyr. praeoc. ? [*Hadena*, Schrnk. (1802) Tr.: *Tholera*, Hb. (1822) Warr.-S., Hamp.: *Heliophobus*, Bdv. (1829-40) Steph., Gn., Newm., Barr.: *Epineuronia*, Rbl. (1901) Stdgr., South, Splr., Culot, Meyr.] *popularis*, Fb. (1775) = *decimalis*, Poda (1761).

Early authors classed all Noctuae with pectinated antennae as Bombyces. Fb. Haw. Esp. Tr.

The original description of *popularis*, Fb. was not as Tutt gave it, in Fab. *Ent. Sys. auct.* (1793), but in Fab. *Sys. Ent.* 577 (1775), before the *Verz.* of Schiff. It runs

ORIG. DESCIP.—“*Bombyx popularis* alis deflexis fuscis, albo striatis, stigmatibus albis, pupilla brunnea.” Wholly inadequate but as subsequently amplified and supported by references must pertain to our species.

Werneberg *Beitr.* I. 503 (1864), points out that Fab. first described this species in the *Sys. Ent.* 577 (1775) as *popularis*, but in *Sp. Ins.* II. 205 (1781), considered it a form of *graminis*, L. quite in error, which error he retracted in the *Mantissa* (1787) and again in *Ent. sys.* (1793). Bork. *Naturg.* IV. 401 had already pointed out this error of Fab. and its rectification. Werneberg also, *l.c.* p. 298 shows that *popularis*, Fabr. (1775) is the *decimalis*, Poda. 1761. Which last is the prior name without doubt.

Bork. *Naturg.* IV. 401, refers to Rottemburg, *Naturf.* VIII. 105. “Probably this Noctua is that insect which Rott. considers to be the *graminis*, of Linn.”

Rottemburg, *Naturf.* VIII. 105, says that Hufnagel has not described the *graminis*, Linn. but (*Euclidia*) *mi*, with which *graminis* (*i.e.* *popularis*) has no similarity; but is most of all like *typica*, from which

it is distinguishable by its feathered antennae, etc. He (Rottemburg) has frequently taken the ♂ but never obtained a female.

Treit., *Schm.* V(1). 318. says that because the authors of the Vienna *Verz.* placed this species (*popularis*) under their *graminis*, it had been carefully compared with the true *graminis*. And Illiger's citations, *Wien. Verz.* IIed (1801), applied to this species therefore are altogether wrong and belong there (to the true *graminis*). See also Laspeyres in *Illig. Mag.* II. 105 (1803).

Tutt, *Brit. Noct.* I. 124 (1891): Barr., *Lep. Brit. Is.* IV. 135. plt. 152 (1897): Stdgr., *Cat.*, IIed. 155 (1901): Splr., *Schm. Eur.*, I. 167. plt. 36 (1905): Hamp. *Lep. Phal.* V. 216. fig. 31 (1905): South, *Moths. Brit. Is.* I. 255. plt. 127 (1907): Warr.-Seitz, *Pal. Noct.* III. 80. plt. 19h. (1909): Culot, *N. et. G.* I(1). 96, plt. 16 (1909-13).

Ernst and Engr., *Pap. de Eur.* V. 59. fig. 244, have 2 good figures except that the greyish along the veins has become obsolescent through age. They identify it with *lolii*, Esp.

Dup. *Hist. Nat.* VI. plt. 90, (1826) has a very good figure: the veins perhaps hardly light enough.

Spuler, *Schm. Eur.* I. 167. plt. 36 (1905), has a very good figure.

Barrett, *l.c.* gives two figures ♂ and ♀ on plt. 152, which show extreme sexual dimorphism. The female is much larger than the male. The forewing is dark olive brown with a clouded central broad band, with paler brown venation. The hindwings are dark smoky grey the veins being darker. The male is generally darker brown, the veins lighter but not so light as in the female. The hindwings are nearly white with a smoky marginal band of medium width. The submarginal line of the forewings shows up more than in the female.

Hamp. *Lep. Phal.* V. p. 217. fig. 31 (1905), has a good b. and w. fig., he mentions *hilaris* but does not note it as very small as Warr.-S. figures it. He puts the *graminis*, Schiff. as this species and the same as *graminis*, Hb.

South. *M. B. I.* plt. 127 (1907), has 2 quite good figures, they show a very slight shade of pink.

Warr.-Seitz, *Pal. Noct.* III. 80. plt. 19h., has very good figures of ♂ and ♀ and of a very small form of *hilaris*, Stdgr.

Culot, *N. et. G.* I(1). plt. 16. 7-8 (1909-13) has two excellent figures.

Barrett says of the Variation—"Hardly ever variable except in the colour of the hind-wings in the male, the smoky-brown transverse band near the margin being in some individuals dark but narrow, sharply but irregularly defined behind, and even broken up by the white ground; in others cloudy and extended so as to shade nearly one half of the surface."

The Names and Forms to be considered are.

decimalis, Poda (1761), *Mus. Graec.* 92.

popularis, Fab. (1775), *Sys. Ent.* 577. South. *l.c.* plt. 127.

lolii, Esp. (1782), *Schm. Abbild.* III. 241. plt. 48. 1-5.

ab. graminis, Hb. (1802). [Schiff. *Verz.* 82 (1775)]?

popularis, Haw. (1803), *Lep. Brit.* 117.

typicoides, Don. (1811), *Nat. Hist. Br. Ins.* plt. 505.

race *hilaris*, Stdgr. (1901), *Cat. III* ed. 155. Warr.-Stz. *Pal. Noct.* plt. 19h.

subsp. *nervosa*, Zerny (1927). *Eos.* III. 366. plt. IX. f. 14.

ab. *amarginata*, Schaw. (1927). *Verhand. zool.-bot. Wien.* LXXVII. (82).

Tutt dealt with *popularis*, Fb. and *graminis*, Hb., both in part.

decimalis, Poda. *Mus. Graec.* 92 (1761).

ORIG. DESCIP.—“*P. Geometra pectinicornis alis cinerascentibus: primoribus fibris, unitate et zero albidis notatis.*” “*Pectinatae alis rotundatis.*”

Poda placed it among the Geometers.

lolii, Esp. *Schm. Abbild.* III. 246. plt. 48. 1-5 (1782).

ORIG. DESCIP.—“*Alis fuscis, venis albidis, fascia marginali macularum nigra, media disci majori albida, minori adjacente circinali, utrisque puncto seu linea nigra notatis.*” Esper goes on to compare this with *typica* referring to the feathered antennae of the male, the light stigmata of the same sex and to the curved discoidal of the female. He notes that it varies much, some examples being quite unrecognisable at the first glance.

Both description and figure more or less agree with the typical form.

Esper's *lolii* is placed among the Bombyces.

Werneberg put Esper's *lolii* as *decimalis*, Poda, which is *N. popularis*, Fb.

Warr.-Seitz. puts *lolii*, Esp. and *graminis*, Hb. as synonyms of *popularis*.

Hb. *Saml. Noct.*, fig. 59 (1803) with the name *graminis*; in his Text, p. 174 (1805-18), he calls it *popularis*, Fb., *graminis*, Schiff. and *lolii*, Esp. The description is very inadequate mentioning only the general pale ground colour with neat black markings of the fore-wings, the greyish hind-wings with dark band, and the long greyish body. There is no reference to the pinkish suggestion of the figure mentioned by Tutt.

Stdgr. puts *graminis*, Hb. as an ab. of *popularis*.

Haworth, *Lep. Brit.* p. 117 (1803) simply altered the termination of Fabricius' name.

Donovan, *N. H. of Brit. Ins.* XV. p. I. plt. 505 (1811), figures this species under the name *typicoides*, no doubt on account of its similarity to *typica*.

race *hilaris*, Stdgr. *Cat. Lep. Pal.* 155 (1901).

FIG.—Warr.-S., *l.c.* plt. 19h.

ORIG. DESCIP.—“*Dilutior, al. ant. albidius venatis, al. post ♂ (fere) totis albidis (candidis).*”

Hamp. *Cat. Lep. Ph.* V. 216. (1905) “*Paler; hindwing of male almost entirely white.*”—S. E. Russia, Armenia, Asia Minor. No mention is made of size.

ab. *amarginata*, Schaw. *Verhand z. b.* LXXVII (82) (1927).

ORIG. DESCIP.—“*♂ Strongly marked white veins and stigmata,*

normally dark ground and hindwings, but without the whitish pre-marginal zigzag-line."

subsp. *nervosa*, Zerny. *Eos.* III. 366 (1927).

FIG.—*l.c.* plt. IX. f. 14.

ORIG. DESCRIP.—"Smaller build than typical examples (F.w. 16-17.5mm.) with sharp clearly cut markings; so also the veins are clearly whitish defined, and the subterminal line which is more strongly toothed than in typical examples. The orbicular is larger, the whole breadth of the cell filled in and its upper and lower margins blending with the white powdering of the veins, the claviform shorter and more rounded. In the hindwings the whitish veins stand out sharply on the darkened border area, etc." Arragon, Spain.

Neuria reticulata, Vill.

Neuria, Gn. (1841 or 4?) Dup., H.-S., Tutt, Barr., South, [*Hadena*, Schrnk. (1802) Tr., Steph., Wood., Bdv., Err., Hamp., Warr.-Seitz: *Melanchra*, Hb. (1822) Meyr.: *Mamestra*, Hb. (1822) Stdgr., Splr., Cul.] *reticulata*, Vill.

The older authors seem doubtfully to consider *anceps*, Schiff. *Verz.* p. 81 (1775) to be this insect. The original description of *anceps* is "The honey brown, white-veined Noctua." Fabricius excludes it from all his works published subsequently. Göze (1781) only lists the reference. Villers (1789) does not refer to it at all. Borkhausen refers to the doubt surrounding the identification of *anceps*, Schiff. with the insect described by De Geer., *Mem. Ins.* II(1). 441 plt. 7, as "A brown *Phalaena* with a grey network of streaks," and names the latter as *saponaria*, *Naturg.* IV. 370 (1792). This name was used by many authors until recently. Illiger in 1801, *Verz.* IIed., refers to the remarks of Bork. and notes that the ground colour "honey-brown" does not agree with the colour mentioned in the descriptions of Bork. and De Geer.

Vieweg. *Tabell. Verz.* II. 71 (1790) gives a very good description of *reticulata* (*saponaria*) under the name *calcatrippe*.

Bork., IV. 372 (1792), emphasizes the disagreement of his *saponaria* with *anceps*, Schiff., by pointing out that the former has more the life-history facts of *cucubali* and *capsincola* in that the larvae fed on seeds or seed vessels alone of species of soapwort, and rested during the day on the plants or in the seed vessels, whereas the latter was associated with species whose larvae had quite different habits, feeding generally on low plants and hiding during the day in the earth ("Larvae terri-colae") [such as *brassicæ*, *furva*, *nigricans*, etc.]

Haw. *Prodromus* (1801) used the name *typicoidina* for this species, but as there was no description the name falls, and in his *Lep. Brit.* Haw. calls it *marginosa*, p. 195 (1806-10).

Meyrick, *Rev. Ed. Brit. Lep.*, 152 (1928), places it in the genus *Melanchra*, Hb. with a mixed assemblage to say the least, *trifolii*, *conspicillaris*, *genistæ*, *oleraceæ*, *brassicæ*, *tinctæ*, *myrtilli*, *melanopa*, etc. The genus *Melanchra* appears based on "Head rough-scaled; eyes hairy." All the other characteristics appear "more or less." There are about 250 species in this "omnibus" genus, as Meyrick conceives it.

Tutt *Brit. Noct.* I. 125 (1891): Barr. *Lep. Br. Is.* IV. p. 151, plt. 153 (1897); Stdgr. *Cat. III* ed. 159 (1901): Hamp. *Lep. Phal.* V. 212, fig. 29 (1905): Splr. *Schm. Eur.* I. 174, plt. 37 (1905): South *Moths Br. I.* I. 254, plt. 126 (1907): Warr.-Seitz *Pal. Noct.* III. 79, plt. 19g (1909): Culot *N. et G.* I(1). 109, plt. 18, f. 16 (1909-13).

Ernst and Engr. *Pap. d'Eur.* have 3 good figures 462 (a, b, c), which they misidentify with the *leucographa*, Schiff. Werneberg, *Beitr.* II. 110, identifies them with *calcatrippe*, View. = *saponariae*, Treit.

Dup. *Hist. Nat.* VI. plt. 90, 2, gives a good figure which shows a very slight flush of violet or purple (1826).

Wood, *Index Ent.* plt. XII. fig. 246, has a good figure of the British form (1834).

Herr.-Schäff., *Sys.-Bearb.* II. 293, (1846) says that Hübner's fig. 58 (*typica*) is much too dull, the curved line too little brought out.

Frr., *N. Beitr.* III. plt. 231 (1839), has an excellent figure.

Hamps., *Lep. Phal.* V. 212, fig. 29, has a good b. and w. illustration but with the "net" markings rather too prominent.

Splr., *Schm. Eur.* I. plt. 37, has a good figure of the *typica* with vinous shade.

Barrett, *l.c.* figs. 2 and 2a are poor, too dull brown, omitting proper emphasis of marking in the submarginal area, and the hindwing in 2a has a discoidal transverse line I have not seen in any specimen.

South, *M.B.I.* I. plt. 126 has goods figures of ♂ and ♀, perhaps somewhat too brown.

Of the Variation Barrett says "Very slightly variable in depth of ground colour, extremely constant in markings."

The Names and Forms to be considered are :—

[*anceps*, Schiff. (1775) *Verz.* 81.]

reticulata, Vill. (1789) *Ent. Linn.* II. 254.

calcatrippe, View. (1790) *Tabell. Verz.* II. 71.

saponariae, Bork. (1792) *Naturg.* IV. 370.

typicoidina, Haw. (1801) *Prodromus*.

ssp. *typica*, Hb. (1802) *Samml.* 58, *Text* p. 174 (1805-?).

marginosa, Haw. (1806-10) *Lep. Brit.* 195.

ssp. *unicolor*, (1889) *Alph. Mem. Rom.* V. 147.

ab. *kitti*, Schwrd. (1914) *Jah. Wien. ent. Ver.* XXIV., 125.

Tutt deals with (1) *reticulata*; (2) the violet tinted ssp. *typica*, Hb.; (3) *marginosa*, Haw.; (4) the more uniform coloured ssp. *unicolor*, Stdgr.

Stdgr., *Cat. III* ed. 159 mis-spells the name *reticulata*.

Dup. *Hist. Nat.* VI. 272, speaks of the ground as a deep bistre tending to violet in fresh specimens.

Neither Stephens nor Barrett speak of a violet, vinous or purple shade. Umber brown is the colour of the ground.

Hübner, *Samml.* fig. 58. named *typica* is a *reticulata* form. In his *Text*, p. 174. Hb. alters the name to *saponariae*, Bork. and his description runs :—

"Purple grey, Head and thorax blackish marked: the upper wing very pale with paler blackish marked central spots and waved line, with

other black markings the lower wing greyish, grey banded; the abdomen greyish, shaded grey over the back."

That is a rich purple-brown form, as Tutt says.

Of the *unicolor* in the Dobrée-Fox Coll. Browne says, *Cat.* p. 48, that the "ground colour is pale brownish grey, and the pale lines therefore not so distinct, giving a washed out appearance." Kaschgar (1888).

Of *unicolor*, Stdgr., Warr.-S. *Pal. Noct.*, III. 79, remarks that *reticulata* loses its violet sheen shortly after emergence, suggesting that *unicolor* is only a flown specimen.

ab. *kitti*, Schwrd. *Jah. Wien. ent. Ver.* XXIV. 125 (1914).

ORIG. DESCIP.—"A fresh pair were remarkable by their black ground colour and pure white markings, without reddish suggestion. The white transverse lines appear single and are not doubled. The hindwings blackish grey. These imagines appear very distinct from the strong contrast of the white veins and transverse lines and the quite pure white expressed stigmata." Neubruck, S.W. Lower Austria.

Heliofobus, Bdv. (1829) Gn. (1852), Newm., Tutt, Stdgr., South, Meyr.: [*Hadena*, Schnrk. (1802) (Bdv.) Tr. Roths.: *Episema* Ochs.-Tr. (1816-25) Bdv.: *Orthosia*, Hb. (1822) H.-S.: *Eurochlaena*, Led. (1857 for *hirta*, Hb. only) Barr.: *Leucochlaena*, Hamps. (1906) Warr.-Seitz] *hispida*, Hb.-G. (1828-33) = *oditis*, Hb. (1822).

The genus *Heliofobus* of Bdv. was not described by him, but only certain species were indicated and placed under that name in *Ind. Meth.* 1829. But this name was abandoned by him in his *Ind. Meth.* of 1840 and the genus name *Episema*, Ochs.-Tr. (1816-25) was substituted. It was fully described by Guenée *Noct.* V. 168 and hence should bear his name.

Boisduval and others put down *oditis* (*odites* in error) as a Russian insect, but Eversmann does not even mention it in either the *Fauna Volg.* or in his special article on the Russian Noctuae.

About 1822 Hüb. *Samml.* 694-5 figured a species he called *oditis*. About 1827 Geyer *l.c.* 784-6 figured a very similar species which was called *hispida*.

In 1849 an insect was taken at Exmouth and recorded in the *Zoologist* for that year, identified as the *hispida*, Hb.-G. It had previously been taken in the I. of Portland but not recorded.

In 1889, *Ent.* XXII. 136, Tutt refers to the "purplish-brown" of the forewings and the "delicate violet" of the pale markings of the *hispida*, Hb.-G. as not being present in our British examples and suggests that the Torquay specimens in particular appear to be Hübner's *oditis*.

No one followed up this clue until Warr.-Seitz in *Pal. Noct.* III. (1910) substituted the name *oditis* for *hispida*. In fact Herr.-Schäff. appears to have been the only author with any knowledge of the species. He says in a note under *hispida*, *Sys. Bearb.* II. 136 (1845). "Here might perhaps be placed the *oditis* from S. Russia, Hüb. fig. 694-5 which no one knows. The fig. appears to be a female, much worn and with imperfect fringes. The difference of this from the

female of *hispida* is not much, only the waved line is irregular and the light edging of veins 3 and 4 before it is wanting." Even Stdgr. does not include *oditis* in either of his three editions, but adds a note in *Cat. II*ed. 1871 that *oditis* does not appear to belong to the European fauna.

In 1919 Count Turati, *Nat. Sicil.* nos. 7-12, made an intensive study of the *hispida* group of species with an investigation of their genitalia as a basis, illustrating his remarks with 13 very clear black and white figures of imagines and 4 of the genitalia.

He found that the appendages of *hispida* were distinct from that of *oditis* and also that his description of the appendages of *oditis* agreed with that of Pierce of the appendages of the British "*hispida*," thus proving that our species was not *hispida* but true *oditis*. Further he found that the appendages of Guenée's var. A. of *hispida* named *intermedia* by Tutt, were quite distinct. That is that *intermedia*, Tutt, was a good species. The forms *pallida*, Tutt, *argentea*, Tutt and *obsoleta*, Tutt were forms of *oditis*, while *hispanica*, Warr. was a form of *hispida*. To these must be added Tutt's *suffusa*, which apparently Turati did not possess to discuss.

Since these results of Turati's investigation were published, Dr Zerny makes the suggestion of error in Turati's descriptions of the ancillary appendages in that he did not clear the thick-lying hair from the valves. He himself had not sufficient material to test the accuracy of these results. ("*Lep. von Abarracin*," *Eos.* (1827) 375.)

Incidentally Turati pointed out that on Warr.-Seitz plt. 29c the figure labelled *oditis* should be *hispida*, Hb.-G. and that the *hispanica* marked ♂ should be ♀.

Hampson ignores the name *oditis* altogether, not even including it in his list of "species omitted."

Tutt *Ent.* XXII. 136 (1889), *Brit. Noct.* I. 125 (1891): Barr. *Lep. Brit.* Is. IV. 269, plt. 38, 7 (1905); South, *Moths. Br. I.* I. 267, plt. 127 (1907): Turati, *Nat. Sic.* p. 89 (1919): [Stdgr. *Cat.* IIIed. 177 (1901): Splr. *Schn. Eur.* I. 198, plt. 38 (1905): Hamp. *Lep. Phal.* VI. 133, fig. (1906): Culot *N. et. G.* I(1), 175, plt. 32, 7 (1909-13)].

Newman, *Brit. Moths* 292 (1870) has a very good b and w fig.

Barrett, *l.c.* plt. 165, figs. 8 and 3a are not good as regards colour and emphasis of marking, and the hindwings have the transverse discoidal line in the wrong position and far too straight. Fig. 36 is an extreme pale form, "yellowish grey" ground.

South, "*M.B.I.*" I. plt. 127 (1907) has two rather fuzzy figs.

Of the Variation Barrett says, "Rather variable in the tone and depth of the ground colour, which in some individuals is tinged with chocolate-brown, in others with grey-brown, or slate-grey; also in the colour of the pale markings, which often are of a brownish-white, or, on the other hand are broadened and rendered more conspicuous. More rarely the markings are partially obliterated, the basal portion and that between the second and subterminal lines becoming almost wholly dark brown. These variations are rather of a local character, though every intermediate shade is found; specimens from the Isle of Portland being often of a dark grey colour, while those from Devon

have the white markings tinged with brown. Occasional specimens are found of a pale olive-grey with very faint markings.

Barrett records a specimen "which has the row of black-brown wedges before the subterminal line very large, conspicuous and complete."

He also records an example which "has the two upper stigmata joined together and converted into a single loop."

Barrett also records another in which "the ground colour is pale yellowish-grey." see *l.c.* plt. 165, fig. 3b.

The Names and Forms to be considered are:—

oditis, Hb. (1822) *Samml.* 694-5.

hirta, Dup. (1826) *Hist. Nat.*, VI., 275, plt. 90, 3 (nec. Hb.).

hispida, Hb.-G. (1828-33) *Samml.* 784-6.

pilosa, Bdv. (1840) *Ind. Meth.* 139.

intermedia, Tutt (1889) *Ent.* XXII. 136.

ab. *suffusa*, Tutt, (1889), *l.c.*

ab. *argentea*, Tutt (1889) *l.c.*

ab. *pallida*, Tutt (1889) *l.c.*

ab. *obsoleta*, Tutt (1889) *l.c.*

Tutt dealt with (1) the dark brown and deep ochreous form *suffusa*; (2) the dark brown form with silvery white markings, *argentea*; (3) the pale brown grey form with white h.w. *pallida*; and (4) a very peculiar dull grey form with a sparsity of pale markings, *obsoleta*.

Intermedia, Tutt, is not a British species. It is a continental form of the continental species *hispida*.

In his description of *pilosa*, Bdv. *Ind. Meth.* (1829) p. 70, says "*cupreis micantibus*" on the fore-wings, which certainly does not apply to our *oditis*. He says it is the *hirta*, Dup. (1826) described and figured plt. XC. 3 in *Hist. Nat.* VI., 275 and there referred to Hübner's fig. 591 labelled *hirta*. The fig. of Duponchel is certainly not that of Hübner's insect *hirta*, hence the action of Bdv. In his *Cat.* 1844. p. 155, Dup. rectifies his name *hirta* to *hispida*, Hb. He had previously (1836) recognised his error, *Hist. Nat. Sup.* III. 177 but made a further error in ascribing the name *pilosa* to Hb. instead of to Bdv.

Charaeas, Steph. (1829) Dup., Gn., Barr., Meyr., Stdgr., Splr., South, Culot. [*Episema*, Ochs. and Tr. (1816-25): *Lycophotia*, Hb. (1822): *Heliophobus*, Bdv. (1829?) Steph. (*Cat.*): *Cerapteryx*, Curt. (1833) Ljung, Hump. and W., Hamp., Warr.-S., Meyr.] *graminis*, L. (1758).

Heliophobus, Bdv. was not described until Dup. *Cat.* (1844).

All the older authors placed *graminis* in *Bombyx* following Linn. on account of its strongly feathered ♂ antennae. Esp., Bork., Fab., Hb., Steph., etc.

Tutt, *Ent.* XXII. 154 (1889); *Brit. Noct.* I. 127 (1891); IV. 109 (1892): Barrett, *Lep. Br.* I. IV. 129. plt. 151 (1897): Stdgr. *Cat.* III. 154 (1901): Hamp. *Lep. Ph.* V. 462. fig. 134 (1905): Splr. *Schm. Eur.* I. 167. plt. 36 (1905): South, *M.B.I.* I. 256. plt. 1907; Warr.-

S. *Pal. Noct.* III. 93. plt. 20hi (1910) : Culot, *N. et. G.* I(1). 95. plt. 16. 4. (1909-13).

This species being a pest of pasture fields has been noticed by nearly every writer on the natural history of insects on the continent for more than 200 years.

Esper. *Abbild.* III. plt. 68 (1782) has two good figures of *graminis*, fig. 1 a ♂ with white reniform and orbicular on a white connecting line running finely to the base, with the outer end swollen terminating in a bifid point and with a spur below the reniform. Fig. 2 has a similar arrangement but in light brown with a curve towards the costa from the outer end, and below the line from the base another wider and shorter one somewhat lighter in tint. The ground colour too is more uniform without the black submarginal marks of fig. 1 on the forewings. Fig. 3 was described as another species and named *tricuspis*. It is of ochreous ground with white markings on the disc, the termination of the white line, the reniform, the lower branch forming the 3 cusps of a trident, and the orbicular with an extension basalwards. The submarginal marks are present. The hindwings also lighter.

Ernst. and Engr., *Pap. d'Eur.* VI. 174. fig. 395 (1788), have 2 figs, one with light brown ground, the other with a brown orange ground; the former has fairly normal marking, the latter only the three stigmata, the trident line being absent.

Fab. *Sp. Ins.* II. 204 (1781), in error places his *B. popularis* of the *Sys. Ent.* as a var. of *graminis*. This he corrects in his later works. (Werneb. *Beitr.* I. 503).

Schiff. *Verz.* 82 (1775) calls it the "Futtergras" moth.

Curt. *Br. Ent.* plt. 451 gives an excellent figure which Gn. says is the *tricuspis*, Esp.

Don., "*N. H. Br. Ins.*" (1808) XIII. plt. 458, has 2 very good figs. of ♂ and ♀ forms.

Hüb. *Saml.* 480-(401) 481, (1808-18) has figured two mutations, 480 being more rosy than any example I have seen. He had previously, (1802), fig. 143, pictured the *tricuspis* form, which in his *Text.* 187 (1805-?) he says is a female *graminis* as is fig. 481, 480 being a male. He calls it the "meadow-grass owl-moth."

Hump. and Westw. *Brit. M.* I. plt. 22 have a good average figure.

Dup. fig. 4. on plt. 85 *Hist. Nat.* VI. (1826) is a very poor one.

Barrett gives seven figures of *graminis* on plate 151.; fig. 2a is that of an unusually large female, the others show various mutations of the discal markings on fore-wings, etc. The figures compared with Seitz are immeasurably to the detriment of the latter.

South's figures, *Moths Br. Is.* I. plt. 127, are very poor fuzzy pictures, without definition.

Warr.-Seitz., *l.c.* gives 7 figs. on plt. 20. all of which are so similar in coloration as to be of little value, except as registering slight variations in the emphasis and development of the markings. The fig. of *megala* does not agree with its description on p. 94 in various particulars as well as size.

Culot, *Noct. et G.* I(1). plt. 16, gives three figures; 4 and 5 are both unusually rufous in colour and rather extreme in their paucity of marking and are certainly not approaching typical; 6 is a very good

figure of the form *albinea*. On p. 95 Culot himself notes fig. 4 as a remarkable example suggesting that it is extreme.

Of the Variation Barrett says: "Variable in the ground colour from olive-brown to red-brown, and more rarely to very pale olive-brown on the one hand and to rich, dark, chocolate-brown, on the other; often also the smaller nervures are obscured by the ground colour in varying degrees, till sometimes the margins and portions of the larger nervures, are also of the general colour, leaving the "antler" alone pale; more rarely this also is curtailed, but the reniform stigma and the portion of the median nervure attached to it appear always to retain the pale colouring. Variations in this direction are usually of a reddish colour, and are very much more frequent in the female; they are also more abundant in Ireland. In the opposite direction the white colour of the nervures often spreads into whitish stripes, leaving the dark ground colour only in elongated blotches darkest around the stigmata; but on Dartmoor this variety has these blotches quite black."

Barrett records specimens from Shetland "of a pale olive-brown varying to olive-buff or pale yellowish-buff, some of them with the markings scarcely visible."

He records another from County Antrim, "a large female of a smooth pale reddish-brown devoid of dark clouding and with the pale markings very obscure."

Another Irish form "has the 'antler' mark strangely jagged on each side and quite extended beyond its usual shape."

Stephens, *Ill.* II. 111 (1829) refers to examples (1) "the row of black streaks towards the hinder margin nearly obliterated"; (2) "the anterior wings with the exception of the stigmata and trifurcate line, of an uniform colour"; (3) "the space between the stigmata, and on the hinder margin, deep fuscous"; (4) "the stigmata edged with deep black on a plain ground."

The Forms and Names to be discussed are as follows:—

graminis, L. (1758). *Sys. Nat.* Xed. 506.

ab. *tricusps*, Esp. (1782). *Schm. Abbild.* III. 348. plt. 68. 1.

[*tricusps* Hb. (1802).] *Saml.* 143.

gramineus, Haw. (1803). *Lep. Brit.* 117-8.

[*graminis* Hb. (1808-18)]. *l.c.* 480-1.

subsp. *hibernicus*, Curt. (1833). *Brit. Ent.* 451.

ab. *albinea*, Bdv. (1841) *Icones*, plt. 74. 4.

subsp. *megala* Alph. (Stdgr.) (1882) *Hor. Ross.* XVII. 64. plt. 3. 55.

ab. *albiguttata*, Sven. (1884) *Ent. Tidskr.* 161.

ab. *brunnea*, Sven. (1884) *l.c.*

ab. *rufa*, Tutt (1889) *Ent.* XXII. 154.

ab. *rufo-costata*, Tutt (1889) *l.c.* 154.

ab. *ochrea*, Tutt (1889) *l.c.* 155.

ab. *obsoleta*, Tutt (1889) *l.c.* 155.

ab. *pallida*, Tutt (1889) *l.c.* 155.

ab. *grisea*, Splr. (1905) *Schm. Eur.* I. 167. 36.

[*megala*, Bng. Hs. (1910). *Iris.* XXIV. 38.]

subsp. *furiosa*, Bng. Hs. (1910) *Iris*, XXIV. 38.

ab. *manca*, Ljung (1918) *Ent. Tid.* XXXIX. 83. fig.

Bork., *Naturg.* IV. 427, (1792), says that *tricuspis* is, he believes, the German form of the northern *graminis*.

Haw. *Lep. Brit.* 117 (1803), included it in *Bombyx* and called it the "Antler."

Stdgr., *Cat.* IIIed. 154, includes *megala*, Alph. as a *graminis* form with a query as to being a species.

Hamp. *Lep. Phal.* V. 463 puts *megala* as a form of *graminis*. "Larger, ♂ antennae more strongly pectinated, markings as in *tricuspis*."

Brown, *Cat. Dob.-Fx. Colln.* (1909) 29 says *hibernicus* is "small" (33mm.) Both Curt. and Steph. say it is "v. large." (See Barrett's fig. 2c. on plt. 151.)

Brown, *l.c.* says that *rufa*, Tutt=*tricuspis*, Hb. (nec. Esp.) and that Barrett's fig. plt. 151, 2a is *rufa*.

Warr.-Seitz, *Pal. Noct.* III. 93, puts *tricuspis* ♀, Esp. and *ochrea*, Tutt, as the same as the typical *graminis*, L.; the *rufa*, Tutt as *tricuspis* ♂, Esp.; the *albinea*, Bdv. as the *graminis*, Haw.; the *megala*, Alph. as a separate species.

Tutt dealt with (1) *graminis*, L., grey, with 3-branched central line and stigmata glaucous. (2) *gramineus*, Haw., grey with white 3-branched central line and stigmata yellowish. (3) *tricuspis*, Esp., red-brown, with ochreous ramose central line and stigmata. (4) *rufa*, Tutt=*tricuspis*, Hb., red-brown with white ramose central line, whitish stigmata. (5) *rufo-costa*, Tutt=*graminis*, Hb., grey with red costa, ochreous ramose central line and stigmata. (6) *hibernicus*, Curt., dull yellowish brown, ochreous ramose central line and stigmata. (7) *ochrea*, Tutt=*tricuspis*, Esp., ♀, pale ochreous yellow, with dark nervures, white orbicular and reniform, with a bifid line joining base of reniform. (8) *megala*, Alph. small (large ??) faintly marked more unicolorous than *tricuspis*, Esp. (9) *obsoleta*, Tutt, unicolorous grey with sparse marking. (10) *pallida*, Tutt, extended white over whole centre of wing including the stigmata. (11) *albipunctata*, Sven., red-brown with dark nervures and white spot at end of reniform. (12) *brunnea*, Sven., forewings ground-colour red-brown ("a description so general as to be useless," Tutt). (13) *albinea*, Bdv., dealt with in vol. IV., 109 (1892) brown grey reddish towards inner margin, nervures pale (whitish) reniform and orbicular white.

In *Br. Noct.* IV. 109, Tutt gives a description of *albinea*, Bdv., and says it closely resembles his *rufa* which itself = *tricuspis*, Hb., *i.e.*, fig. 143 of the *Saml.*

subsp. *megala*, Alph. *Hor. Soc. Ent. Ross.* XVII. 64. (1882).

FIG.—*l.c.* plt. 3. f. 55.

ORIG. DESCIP.—"Major, colore valde varians, saepe alae anticae ad basin palliores."

"The colour varies from clear or dark testaceous to the red of *Agrotis castanea*. The characteristic angular spot is always very white and differs in no way from typical *graminis*. The base of the forewing is very often lighter than the ground. Very often, too, one finds two shades taking the place of the extrabasal and the elbowed lines of *Agrotis*. The area between the elbowed line and the outer margin

appears as a wide band somewhat wavy, lighter than the ground and traversed by blackish nervures." Thian Shan.

Of this Bang-Hs. says, *Iris* XXIV. 38 (1910) "Of a yellow brownish colour." Central Asia.

Hamp. *Cat. Lep. Ph.* V. 463 (1905) says "Larger; the antennae of male more strongly pectinated; markings as in *tricuspis*."—Armenia;—W. and E. Turkestan.

ab. *grisea*, Splr. *Schn. Eur.* I. 167 (1905).

ORIG. DESCIP.—"A grey form is found in N. Germany with an extremely well defined dark central area: in the male the dark markings are strongly developed; in my opinion they are covered by none of the many described forms of this very variable species; it stands out well from the rest and might be called *grisea* (the grey)."

ab. *furiosa*, Bng. Hs. *Iris.*, XXIV. 38 (1910).

ORIG. DESCIP.—"By far the greater number of the subsp. *megala* obtained in large quantity from Central Asia have yellow-brownish coloration; to the specimens coloured bright rose occurring less commonly which we obtained particularly from the Juldus neighbourhood, I have attached the name ab. *furiosa*. They often reach the expanse of 35mm. for the ♂ and 40mm. for the ♀."

ab. *manca*, Ljung. *Ent. Tidskr.* XXXIX. 83 fig. (1918).

FIG.—*l.c.*

ORIG. DESCIP.—"The forewing on the outer half is uniformly grey-brown without trace of the arrow-head spots or otherwise coloured veins; the central area is dark shaded; the orbicular is absent; the reniform which is lighter than the ground colour adjoining is like a sickle-shaped streak, the prominent spot below the reniform is continued along below the discal vein as a wide obscurely margined streak."

The figure is very poorly executed and does not agree with the above description.

Aporophyla, Gn. (1841) Bell., Mill., New., Barr., Meyr., Stdgr., Splr., South, Hamps., W.-S., Cul. [*Hadena*, Schnrk. (1802) Bdv., Curt.: *Agrotis*, Hb. (1806) Curt., West. and H.: *Xylina*, Tr. (1816-26) Bdv., Frr., H.-S.: *Xylophasia*, Steph. (1829) H.-S.: *Egira*, Dup. (1844)] *australis*, Bdv. (1829).

Treit. quoted the name *Xylena*, Hb. as *Xylina*, Hb. and actually was the first to describe the genus.

Curtis had named the British form *pascuea* in 1827, *Brit. Ent.* V., 185, but gave no description or figure. This was done by Westw. and Humph. in 1841, *Brit. Moths* I. 123, plt. 25.

Tutt *Brit. Noct.* I. 131 (1891); *l.c.* IV. 109: Barrett, *Lep. Brit. Is.* IV. 282, plt. 167 (1897): Stdgr. *Cat. III* ed., 173 (1901): Splr. *Schn. Eur.* I. 199, plt. 38 (1905): Hamps. *Lep. Phal.* VI. 237 (1906): South *M. B. I.* I. 284, plt. 137: Warr.-Seitz *Pal. Noct.* III. 123, plt. 30c (1907): Culot *Noct. et Geom.* I(1). 170, plt. 33 (1909-13):

Humphreys and Westwood, *Brit. Moths*, I. pl. XXIV. fig. 2 (1841); the *pascuea*, Curt. is a dreadful attempt at colour, but the markings and shape are better. These authors were the first to describe and figure the insect named *pascuea* by Curtis, in the genus *Agrotis*.

Freyer, *N. Beitr.* III. pl. 209, has a good figure of the usual continental form; fig. 2 on pl. 255 is the dark *scriptura*, which has more ample wings and is very smoky above and below. In vol. VI., pl. 508, fig. 1 is *ingenua*, forewing a dark slate colour with submarginal white dots, black on inner sides of each and white defined reniform. Lower wing much paler.

Dup. *Hist. Nat. Sup.* III. pl. XXXV. 5 (1836) gives a much too light figure for a continental form of *australis*, with too great a contrast between the general ground colour and the dark brown costal area and submarginal flush of the fore-wings.

Her.-Sch., *Bearb.* II. 304 (1845) says that both Freyer's figs. 209 and 412 are only very slightly recognisable, that his own fig. 406 (407 in error) has wings too short, that fig. 151 is probably imperfect, and Fré's fig. 255 may be accepted as the true *scriptura*. He refers *ingenua* to his *orientalis*.

Herr.-S., gives figs. 159, 160, 406 of *australis*; figs. 404, 504, 505 of *scriptura*; and figs. 502, 503 of *orientalis*. Figs. 159, 160 are too dark to have the silvery suggestion of our British form, *pascuea*, Curt.; fig. 406 (not 407) not only has the wings too short but also has the marginal band of the hindwing too heavy. Figs. 404, 504 ♂s are very dark *scriptura* but 505 one would hardly call an *australis* form, probably a bad fig. Figs. 502, 503 *orientalis* is a Turkish insect, darker than *scriptura*, of which Tutt, *B. Noct.*, 133, says, "Whether this is an extreme variety of *australis* or not is open to question," and from the figure I agree. However Stålgr., *Stett. ent. Zt.* (1869) who had the originals of *orientalis* and *scriptura* before him, said they were undoubtedly forms of *australis*.

Gn. says that Rambur's fig. on pl. IX. *Ann. Soc. ent. Fr.* (1832) is more correct as to marking while Duponchel's fig. *Hist. Nat. Sup.* III. pl. 35 is more correct in shape.

Newman, *Brit. Moths*, 289 gives 2 good b. and w. figures, somewhat on the large size and too dark for British specimens.

Spuler's fig. *Schm. Eur.* I. pl. 38, 12, is recognisable only.

South, *M.B.I.* I. 284, pl. 137, has 2 good figures, perhaps somewhat too dark.

Warr.-Stz. *L.c.* pl. 30 b.c.d. figures *australis* ♂ and ♀, *costata* ♂ and ♀, *scriptura* ♂ and ♀, *ingenua* ♂ and ♀, and *pascuea* ♂ and ♀. None of the figures do justice to the ground colour of the forms as we know them.

Culot, *N. et G.* I(1). pl. 33, has 2 excellent figures, 1, typical *australis*, 2, the very dark *ingenua*, but without the white dots and the surround of the reniform.

Gn. points out that Dup. had united the *Aporophyla* with the *Xylomyges* (*conspicillaris*) and given the genus a new name, *Egyra*, Cat. (1844) without adequate reason. The fundamental differences he (Guenée) pointed out were that the European *Xylomyges* appeared in early spring from a larva of the previous summer, whereas the *Aporophyla* emerged at the end of autumn from a larva found in early spring. *Noct.* V. 151.

Both Hamps. and Warr.-S. quotes Curtis Vol. V. instead of Vol. IV., and Gn. quotes Vol. III. Curtis names an *Agrotis* as *pascuea*, but gives no description, *Brit. Ent.* IV. 165 (1827).

Warr.-S. *Noct.* III. 123 gives *orientalis*, H.-S., and *morosa*, Bell., as synonyms of *ingenua*, Fr. and *britannica*, Stdgr. as a synonym of *pascuea*, Curt.

Barrett says of the Variation—"Not very variable, specimens taken at the Isle of Portland have the males especially of a light bright grey, or even chalky-white, with the marking brought much more sharply into notice than is usual."

Barrett records a specimen "entirely suffused with dark grey."

Also another "nearly black," in the Isle of Wight.

And one at Wexford, "rather strongly marked with black."

Tutt says, *Br. Noct.* I. 131, "This is an exceedingly variable species."

Hamps. *Lep. Phal.* VI. 237, gives the following forms.

ab. *pascuea*. Thorax and forewing whiter, the latter with the black streaks on basal area and dentate subterminal marks more prominent.—Britain.

ab. *scriptura*. Forewing duller grey.

ab. *ingenua*. Forewing almost uniform fuscous grey.

ab. *cinerea*. Forewing almost uniform pale yellow.—Morocco.

He treats *orientalis*, *britannica* and *morosa* as synonyms.

The Names and Forms to be considered are:—

australis, Bdv. (1829) *Ind. Meth.* Append. 6: Culot. N. et G. I(1).
plt. 33.

subsp. *scriptura*, Fr. (1839) *N. Beitr.* III. 87, plt. 255.

subsp. *pascuea* [Curt. (1827)] H. and Westw. *Brit. Moths.* I. 123,
plt. 24 (1841).

subsp. *orientalis*, H.-S. (1846) *Bearb.* II. 282, figs. 502, 503.

[*scriptura*, H.-S. l.c. figs. 404, 504, 505.]

ab. *ingenua*, Fr. (1848) *N. Beitr.* VI. 42, plt. 508.

subsp. *morosa*, Bell (1862) *Ann. Soc. ent. Fr.* 616, plt. XIV. 7.

subsp. *britannica*, Stdgr. (1869) *Stett. e. Zt.* 91.

ab. *cinerea*, Stdgr. (1901) *Cat.* IIIed. 178.

ab. *albidior*, Bng.-Hs. (1906) *Iris.* XIX. 134.

ab. *costata*, Warr.-Stz. (1910) *Pal. Noct.* III. 123, plt. 30c.

Tutt dealt with (1) *australis* the continental form; (2) *pascuea* (Curt.) H. and W. the British form; (3) *scriptura*, the Turkish dark form; (4) *orientalis* the extremely dark oriental form; and (5) *ingenua*, a form intermediate between the last two forms.

Gn. l.c. was not the first describer of the *pascuea*, Curt. (1852). He treats the *scriptura*, Freyer and the *orientalis*, H.-S. as good species, but says the former is very near *australis*, while the latter resembles *Epunda nigra*.

Tutt did not give the Original Description of *pascuea* the British form, which occurs in Humph. and Westw. *Brit. Moths.* I. 123 (1841) as follows:—

subsp. *pascuea*, H.-Westw. (Curt). *Brit. Moths.* I. 123 (1841).

FIG.—l.c. plt. XXIV. 2.

ORIG. DESCRIP.—Distinguished "In the acutely dentated dark line

succeeding the outer stigma. The expansion of the forewings is nearly $1\frac{1}{2}$ ins. their ground colour being of a very pale buffish white, varied especially towards the costa and middle, with darker brownish clouds; there is also a dusky patch along the posterior margin towards the base. From the base runs a nearly straight black line to near the middle of the wing, but towards the hind margin, where it unites with the dentate line above mentioned; the basal stigma is pale and slightly margined, with black, and preceded by a short, oblique, black line; behind it is a small oval dusky patch, attenuated towards its base and slightly edged with black; and behind this, towards the centre of the hind margin of the wing, is a larger, oval oblong, pale space, margined with a black line. The second stigma is dusky in the centre, and edged with a narrow black line. Towards the apical margin is a row of dusky cuneated patches, followed by a marginal row of black dots. The cilia alternately pale and darker brown. The costa is marked with several minute white dots. The hind-wings are almost white, with the margin slightly undulated." Mr. Marshall's specimen from Lowestoft.

subsp. *morosa*, Bellr. *Ann. Soc. ent. Fr.* 616 (1862).

FIG.—*l.c.* plt. XIV. 7.

ORIG. DESCRIP.—"Forewing of a uniform very dark brown, scarcely allowing the lines and markings, which in typical specimens stand out in black on a clear cinereous ground, to be seen. The reniform stigma is somewhat lightened exteriorly with yellowish grey in the males. The lower wings of the male white with nervures brown; the lower wings of the female entirely brown and bordered with a wide fringe of very pure white." Corsica.

Bellier's figure is presumably a female in which the reniform is not emphasized, although the hindwings are not entirely brown, being lighter at the base.

subsp. *britannica*, Stdgr. *Stett. e. Zeit.* 91 (1869).

ORIG. DESCRIP.—"The English *australis* are very peculiar; they have very sharp markings (black and white) and never appear to be dark."

ab. *cinerea*, Stdgr. *Cat. III* ed. p. 178 (1901).

ORIG. DESCRIP.—"Al. ant. (fere) unicoloribus, cinereis."

ab. *albidior*, Bng.-Hs. *Iris.* XIX. 134 (1906).

ORIG. DESCRIP.—"The white ground colour distinguishes this form from all the rest of the known forms. The arrangement of the marking approaches that of the English var. *pascuea*, Curt., but that is of a much more yellow brown colour." Brittany.

costata, Warr.-Seitz *Pal. Noct.* III. 128 (1910).

FIG.—*l.c.* plt. 30c.

ORIG. DESCRIP.—"Is a larger form, with the brown tints of the type replaced by blackish fuscous, the costal area of forewing and the fringe especially darkened; the lines equally indistinct." Amasia, Rome.

Luperina, Bdv. (1829) [*Dianthoeicia*, Bdv. (1834): *Polia*, Och. and Tr. (1816-25) Hamps., W.-S.: *Harmodia*, Tr. (1816-25) Hamps., W.-S.] *barrettii*, Dbldy. (1864) nec *luteago*.

The genus *Luperina*, as considered by Tutt, contained *luteago*, *dumerilii*, *cespitis*, *testacea*, and *guenéei* (as a var. of *testacea*).

Hamps., *Lep. Phal.* VIII., includes of these only *dumerilii* (misspelled *dumerili*) and *testacea* in this genus with a number of American, European and Asiatic species, a somewhat unnatural association. *Cespitis* he puts in *Tholera* with *popularis*. *Luteago* he puts in the huge genus *Polia* with over 200 other species, very far removed from the group of species we are accustomed to call *Dianthoeicia*.

Warr.-Seitz, *Pal. Noct.* III., place *testacea*, *guenéei* and *dumerilii* with a few extra-British species in *Luperina*; *cespitis* he puts in *Tholera* following Hampson: while he places *luteago* in *Polia*, again following Hampson, but the *Dianthoeicia* group he separates under *Harmodia*, Hb. based on the structure of the imagines and pupae and the larval habit of feeding on the seeds of the species of *Caryophyllaceae*.

Pierce, *Genit. Brit. Noct.* showed that the *Dianthoeicia* (British) species fall into two groups, in the first of which he places *barrettii* (= *luteago* ?), *capsincola*, *carpophaga*, *cucubali*, *irregularis*, etc. *Cespitis* he leaves in *Luperina* with *testacea* and *dumerilii* but remarks that there is nothing in common with these three species.

It is evident from the above opinions that the genus *Luperina* as thus constituted has no natural status.

Warr.-Seitz, *Pal. Noct.* p. 70 has treated *literata*, F. v. Wald. as a distinct species, "known at present only from Sarepta, S. Russia and Askhabad." The first few figures on plate 16 are particularly poor in coloration, but the markings of *literata* given are not those of a *luteago* form.

Mr. W. F. de V. Kane, *Ent. Rec.* II. 275, etc., pointed out that the imago of *barrettii* conformed to the *Dianthoeicia* type; the antennae are *Dianthoeicia* not *Luperina*; the emergence is *Dianthoeicia*; the pupa distinctly *Dianthoeicia* with the well-marked protuberance at the end of the wing-cases; it feeds on the *Dianthoeicia* food *Silene* species; the larval head and first segment are those of *Dianthoeicia*; the shape and pattern of the imago is *Hadenidae* and the other species in *Luperina* are conspicuously devoid of these characters.

In *Brit. Noct.* Vol. IV. 110 (1892) Tutt said "This species (*luteago* = *barrettii*) is now generally considered to belong to the genus *Dianthoeicia*." Stdgr., *Cat. Hf.* 161 (1901) placed it in *Dianthoeicia*. Warr.-S., *Pal. Noct.* III. 70 (1907) placed it in the huge omnibus genus *Polia* with *persicariae*, *psi*, *dissimilis*, *oleracea*, etc., while our British *Dianthoeicia* are placed in a separate genus *Harmodia*, no doubt following Hamps. *Lep. Ph.* V. 79 (1905).

Barrettii has been considered as a subspecies of the continental *luteago* by Staudinger and others, but in 1919 Messrs. Edelsten and Pierce examined continental *luteago* from various localities, as well as *barrettii* and found that their genitalia did not agree (*Proc. Ent. Soc. Lond.* 1919, p. XLV. pl. B.). Some of the forms named *argillacea* from Digne, hitherto attributed to *luteago* were found to be *barrettii*. In *barrettii* and the *argillacea* from Digne the spine of the aedeagus is broad and stunted, that of *luteago* and its form *argillacea* from elsewhere have an elongate spine.

Quite recently Messrs. Wightman and Rayward have gone over the same ground and the results of the previous investigation were amply confirmed as to the differentiation of the two species. But they have gone further. Mr. Wightman has sent me the mounted wing specimens and writes as follows.—“The points I wanted to clear up were that Edelsten and Pierce had shown that there were two species in the *barrettii-luteago* muddle, but had left the matter with both species having a subspecies *argillacea*, which, to my mind is an impossible position, and they had in their paper taken no account of the species called *literata*, also no specimens from Digne (where the *barrettii* occurred) other than the form (called subspecies) *argillacea*, were examined, and in point of fact not all Digne specimens belong to that form.”

“The results of the examination of the genitalia, as ascertained by Mr. Rayward, confirms, as was expected, the distinction between *barrettii* and *luteago* as noted by Edelsten and Pierce, they also prove as far as was possible with the limited material available, that *literata* is a third species very closely allied to both *barrettii* and *luteago*.”

“He also found one of the *Amasia* specimens to be *barrettii*, while the yellow type-like form of the Digne specimens proved to be *luteago* and not *barrettii* (as were all the *argillacea* specimens from that locality examined by Pierce.)

“The results can therefore be summed up, I think, as follows:—

1. There are 3 very closely allied but definitely distinct species occurring on the continent, one only of which occurs in this country.

2. One of these species is correctly called *luteago* and is evidently widely distributed.

3. Another called *literata* is, as far as at present recorded, much more local; Askabad, Transcaspia.

4. While the third species is the one which also occurs in Britain and seems to be correctly called *barrettii*; but it must not be overlooked that when shown the type of *barrettii*, Staudinger said that he considered it the same species as the continental insect known as *argillacea* and if he referred to Digne-taken *argillacea* he was correct.”

“This last point is beyond me, and needs a search of records and possibly examination of museum specimens. So far as is known the distribution of the three species is as follows:—

“*D. luteago*:—Germany (Berlin), Austria (Vienna), Hungary, Ravone, Corsica, Tunis, Latvia, Saratov, Amasia, Uralsk, Spain, Italy, Turkistan, Siberia, France.

D. literata:—Askabad, Sarepta.

D. barrettii:—Cornwall, Devon, Ireland, Channel Islands, Digne, Amasia.

(The above list includes localities of Pierce and Rayward's specimens and those of Seitz-Warren.)

*There still remains the status of the Spanish *andalusica* form, whether it be *barrettii* or *luteago*. That question, however, must be deferred until material can be obtained. Tutt dealt with it under *luteago* following Staudinger's lead. (See below also). Also what is *ab. pallida*, Zerny, *Eos*. 1927?

* I am much indebted to Mr. Rayward and to Mr. Wightman for their very kind help in the consideration of this species.

Tutt, *Brit. Noctuae* I. 184 (1891): Barrett, *Lep. Br. Is.* IV. 261, plt. 165 (1897): Stdgr., *Cat. III* ed. 161 (1901): Hamps. *Lep. Phal.* V. 79 (1905): South, *Moths Br. I.* I. 347, plt. 123, 2 (1907): Warr.-Stz. *Pal. Noct.* III. 70, plt. 16 (1907): Culot, *N. et G.* I(1). 212, plt. 19, fig. 15 (1909-13).

If the figure of *barrettii*, Dbldy. in *Stainton's Ann.* plt. (1864) be carefully compared with the figure of *andalusica*, Ramb. plt. XI. (1858) there appears to be very few characters in common. The latter is a heavier insect and very few markings coincide with those of *barrettii*. The general aspect, shape, etc., does not suggest the figure of *barrettii*. The general consensus of opinions agrees, or the name *andalusica* would have been suggested as prior. Nor does Rambur's figure agree in anyway with that of Birchell, *E.M.M.* III. plt. 1 (1867), which is darker than the Stainton's *Annual* figure.

Newman, *Brit. M.* 390, fig. 620 (1870) has two good b. and w. figures.

Barrett, *l.c.* IV. plt. 165, gives 4 figures: 2, the original specimen ♂; 2a, ♀; 2b, a darker ♂ from S. Wales; 2c, a much lighter grey ♀ from N. Devon, which last is probably the form *ficklini*, subsequently named by Tutt.

South, *l.c.* I. plt. 123, gives a very good figure of *barrettii*; Irish.

Warr.-Stz. does not figure *barrettii*, but on plt. 16 gives two figures of *argillacea* of which the Digne examples have been proved to be *barrettii*. Both are strongly olive brown.

Culot, *l.c.* I(1). 113, plt. 19, figs. 14-15, gives *argillacea* and *barrettii*. Two excellent figures in which *argillacea* agrees generally well in marking, etc., with Hubner's fig. of *luteago* except that it has a somewhat less yellow shade, and is much more delicate than the figures of Warr.-Seitz. It was from the Geneva area.

Hubner-Geyer's fig. 590 named *argillacea* is extremely like Culot's figure in marking, etc., but the dull yellow colour is much too spread over the whole surface just as in the two figures of Warr.-Seitz and probably should be *luteago* f. *argillacea*. Whereas the Digne *argillacea* so called is a *barrettii* form and from the first wrongly identified, hence it might well have a subspecific name, **dignensis**, to identify it apart from *argillacea*, Hb.-G.

Barrett says of the Variation, "The insect (*barrettii*, Irish form) is extremely constant in colour and marking."

Wightman says (*in lit.*) "With us *barrettii* varies greatly and although forms as yellow as those from Digne must be rare even in Cornwall; they certainly do exist. I have one almost as yellow as the continental *luteago* but more heavily marked; now that *literata* is proved to be a distinct species, I think it may be said that they do not, on the continent, get a form as dark as that which with us is normal."

In illustration of these remarks Mr. Wightman has sent for examination a fine very varied series of 10 Cornish and Devon specimens and further writes "My experience is that *barrettii* is a very variable species in any locality, where enough can be taken to see the extent of the local variation. You will see the colour, markings, presence or absence of central band, and size are very varied."

The specimens sent represent as follows :—

1. Melanic with oblique pale streak well displayed. S. Devon.
2. Same form with streak obsolete. Blacker. S. Devon.
3. Large size. S. Devon.
4. Small size. S. Devon.
5. Ochreous ground. Dark banded. S. Devon.
6. Grey-brown; almost greyish mauve shade. S. Devon.
7. Blackish brown. Cornwall.
8. Ochreous. Cornwall.
9. Ochreous brown. Species marking clearly displayed. S. Devon.

"I could easily pick out 30 different forms showing a much wider range than these." The Cornish specimens Wightman puts down as *ficklini*, of which he says.

"I am quite sure that the *ficklini* description only applies to a small proportion of Cornish *barrettii* and is really a form name wrongly given subsp. rank by reason of ignorance of the facts due to lack of material at the time." It is quite certain that the name *ficklini* cannot stand for a British subsp. of *barrettii*, since so far there seems no dominant or general form.

The Names and Forms to be considered are :—

barrettii, Dbldy. (1864), *Stainton's Annual*, p. 124, plt. 1, fig. 5.

f. *ficklini*, Tutt (1898), *Ent. Record*, 151. [Barr. *E.M.M.* 172, (1897)].

f. *lowei*, Tutt (1898), *l.c.*

(ab. *pallida*, Zerny (1927), *Eos.* "Lep. Andalusica" 369, doubtfully *barrettii*.)

subsp. **dignensis** nov. (1933) [See Culot. *N. et G.* I(1). 113, plt. 19, f. 14, and Tutt *Br. Noct.* I. 136.]

Other Names which drop out of consideration are

brunneago, Esp. (1796) = possibly to *luteago* (not a Digne specimen).

luteago, Hb. (1802).

argillacea, Hb. (1808-18) = to *luteago*.

albiena, Hb.-Gy. (1834) = to *luteago*.

andalusica, Ramb. *Cat. Andal.* plt. XI. 4 (1858) doubtfully *barrettii*.

literata, F. de W. (1840) = a distinct species.

nigricans, Wgnr. (1926) = to *luteago*.

andalusica, Stdgr. *Stett. e. Zt.* 214 (1859) = *luteago* form.

Tutt dealt with *barrettii*. All the rest were *luteago* forms.

NOTE.—A ♀ specimen of so-called *brunneago* from Digne does not agree with the description of Esper's figure given by Tutt. The insect Esper figured was probably a *luteago* form and certainly was not named from a Digne specimen.

subsp. *ficklini*, Tutt, *Ent. Rec.* 3 (1898) name only.

ORIG. DESCIP.—Barrrett, *E.M.M.* 172 (1897)—"Leaning towards the Irish variety [*barrettii*, Dbldy.] ; but the light clouding at the base of their forewings, and also in the hinder area, is extended and of a distinctly glaucous hue, while the pale middle cloud is less distinct, and the broad oblique stripe consequently less noticeable. The hind

margin also appears to be slightly more dilated, and the forewings consequently broader and more blunt, but this may arise in part from the perfection of the cilia." Cornish Coast near Land's End.

Subsequently a N. Wales ♀ was obtained "Darker and without tinge of purple in its brown colour, this being replaced by a greyer black tinge and the pale shades are scarcely so large as in typical specimens."

subsp. *lowei*, Tutt, *Ent. Record* 151 (1898).

ORIG. DESCIP.—"♂ smaller than the ♀, ochreous in tint, not unlike the hue of *Eremobia ochroleuca*. Forewings with abbreviated basal line, followed by complete basal line; these with the angulated and subterminal lines, pale whitish grey, edged with fuscous. The costa marked with pairs of short fuscous streaks, one on either side of the commencement of each of the transverse lines. An ochreous yellow patch (below the cell) between the base of the abbreviated and the complete basal lines; the orbicular pale and conspicuous, an ochreous patch below it. The reniform also moderately well marked, pale greyish in colour. These look more conspicuous because of the dark fuscous colour that fills up the central area of the wing between the complete basal and the angulated lines. Between the angulated and subterminal lines the wing is also fuscous, with three small yellow ochreous blotches, one towards tip and one on inner margin, the third just above the latter. The wing beyond subterminal line of the same pale ground colour. The fringes alternately light and dark. The hindwings dark grey, basal area lighter (more especially in male), cilia ochreous grey. Antennae of the male ciliated with a single row of tooth-like projections almost to the tip, those of ♀ not ciliated but very distinctly segmented. The male is paler than the female, both on the forewings (having less fuscous) and hindwings (towards base)." Guernsey.

ab. *pallida*, Zerny. *Eos.* 368 (1927).

ORIG. DESCIP.—Of the Spanish *andalusica*, Zerny says, "Extraordinarily like the Irish *barrettii*, Dbldy." "A ♂ has pale yellowish grey-brown ground colour, with a little of the marking absent." Albarracin in Arragon.

subsp. **dignensis**, nov. (1933) = *argillacea*, Hb. in error.

ORIG. DESCIP.—Forewings ground colour dull orange much clouded with grey; the two stigmata lighter and of a pale dull fulvous; a band of darkish brown lying between the outer line and the reniform stigma running from the costa to the centre of the inner margin, there joined by a similar band from about three quarters along the costa, the two forming a large V enclosing the two pale stigmata with a surround of ground colour, and a darker triangle from costa to between them. The submarginal band between the outer and submarginal waved lines is more or less uniform, both the lines are paler; there are two darker blotches outside the submarginal waved line, one near the anal angle and the other below the apex; inside the inner line there is a lighter pale blotch and near the base the ground is somewhat paler. The inner and outer lines which are both doubled have several curves on their discal sides lined with deep black. There are also

Contributions to the Lepidopterology of the Argentine. II.

By CAPT. K. J. HAYWARD, F.R.E.S., F.Z.S., F.R.G.S.

(Continued from July-August, 1931, p. (8).)

[Further Notes are in hand ready for publication as soon as identifications come to hand.—Eds.]

yellow or buff yellow (IV. b.d.) spot edged outwardly black, the lateral spot larger. A row of marginal tubercles, lighter coloured, the hairs grey and fanned out to form a fringe to the larva so that any dark shadow at the line of junction of the body with the bark of the food-plant is thus completely eliminated. From the marginal tubercle on the first abdominal segment a compact bunch of very finely shafted, spear headed (diamond shaped), black hairs project at right angles to the body for a distance of from 5 to 6mm. The lateral area of the first and second abdominal segments always darker than the remainder of the abdominal colouring and carrying slightly above the margin on each segment an orange spot (generally very near to flame scarlet (II.)). This orange patch occasionally occurs in a subdued form on all the segments of the abdomen.

The eighth abdominal segment has the two dorsal tubercles replaced by a pair of processes resembling truncated horns slightly over a millimetre in length, crowned with a berry-like (brambled) cap of more or less the same colouring as the remaining dorsal tubercles, the whole process clothed with short black hairs, those from the brambled from black bases. The marginal tubercle of this segment, which is placed more posteriorly than on the other segments, carries a somewhat similar bunch of hairs to that on the first abdominal segment, the hairs spear headed as before, but fewer, finer, less compact in arrangement, and also shorter. The general appearance of this segment leads one at first glance to mistake the anal end of the larva for the head end, especially so as the head end is slightly flattened. What purpose this serves I do not quite see, as the larva is so very highly procryptic when on the foodplant, whether at rest or feeding, that further protection seems unnecessary. The ninth abdominal segment has a pair of more lightly coloured dorsal tubercles.

By far the most striking aspect of this caterpillar is however obtained when it is turned over to show the ventral portion. The thoracic segments are velvet black, the prolegs and the ventral portion of the first and second segment (except for a black central line between the base of the pro- and meso-thoracic legs and two black dots on the meso-thorax) vary from Brazil red to the brighter scarlet (I). The first and second abdominal segments have a very beautiful net leopard marking, the sides fine black spotting on white, ventrally larger black spotting of Brazil red to scarlet, the red stripe about a millimetre and a half wide. This form of colouring continues over the following segments up to the seventh, the red central stripe however widening out to fill the space between the legs, the black spotting thereon confined to spotting on the segmental folds, and two larger spots immediately posterior to this latter spotting on the segment proper. On the remaining segments the outer black and white leopard

markings are replaced by velvet black, the central area, and the whole of the underside of the last segment, being Brazil red to scarlet, the only black spotting being the pair of spots immediately posterior to the fold between the seventh and eighth segments and a large central spot slightly anterior to the anus. The abdominal legs are without of the black and white leopard marking, within of the red colour.

I first found this larva seeking a place to pupate, crawling over the bare sand, but the almost immediate finding of two more under similar conditions caused me to look around for the foodplant. From the superficial similarity to the larva of *Artace lilloi* and the fact that a quebracho blanco tree, foodplant of the latter, was the only tree anywhere near, I concluded that both larvae fed on the same tree, but beating this quebracho produced only some larvae of *lilloi*. As I was fairly certain that the larvae found on the sand had not travelled far I searched for some bush with dark bark similar to that of the quebracho, and almost immediately noted two, locally called pata and jarilla negra. On the former, pata locally but better known as albaricoque (*Ximenia americana*, L.) the larvae were found in some numbers, highly procryptic but given away to the entomologist by the dark frass lying on the yellow sand.

The pupa is contained in a Zygaenid-like cocoon, yellowish at first but usually quickly bleaching lighter, rarely brownish. It is however only on the very rarest occasions that the larvae pupate on the foodplant (out of several hundred I have examined only once have I found it on *X. americana*), the insect choosing some adjacent bush, the commonest in this neighbourhood being jarilla (*Larrea divaricata*) and occasionally a stunted *Prosopis*. The bark of the foodplant as also the leaf is very dark and placed on this plant the cocoons would be very conspicuous.

The pupa itself is about 15mm. in length, more or less olive green at first but normally a coffee brown, darkening immediately after pupation. Apart from having the posterior ridge of the abdominal segments highly polished whilst the remainder of the segment is very finely punctate, the pupa shows no outstanding markings.

The larvae are very numerous but appear to be highly parasitised, very few imagines emerging from a great number of specimens collected, whilst not less than 50% of those observed in the wild state had been either partially devoured or contained a small hole from which without doubt a parasite had emerged.

The descriptions have been composed from many larvae collected around Guayapa (near Patquia—Prov. of La Rioja) during the early portion of the month of February, 1931, the pupal period at this time being eight days.

Colours from Ridgeway's *Color Standards and Nomenclature*, 1912.

DESCRIPTION OF THE LARVA AND PUPA OF *TERIAS* DEVA.

Length 45mm.

Face and mouth parts dirty greenish brown, the eyes dark and prominent. A larva of almost uniform colour, nearest to bice green (XVII k.), the upper and underside being alike. Of soft velvety appearance due to a great number of tiny whitish spots covering the larva, the majority of which have minute black hairs or indications of

hairs. On the thoracic segments a ring of more pronounced black hairs, albeit very minute, these on the first sub-segment. On the prothorax the post trapezoidals are well defined. On the abdominal segments the anterior and posterior trapezoidal, supra-, post-, and sub-, spiracular, lateral, and marginal tubercles are more or less distinct. Along the dorsum the alimentary canal shows somewhat darker, whilst there is a poorly defined spiracular line where the green general colouring is somewhat more brownish. The spiracles very small, whitish, only visible on very close examination. The legs, prolegs, and anal claspers dirty whitish, rather small.

The larva was examined for description as it was commencing to pupate, and at this time all the main setae carried minute drops of liquid. As the larva was found at dusk the previous evening the poor light did not permit of close examination, so I cannot say whether the drops of liquid appear always or only when in the commencement of pupation.

The angulated pupa, chromium green (XXXII. f.), the dorsal area deep lichen green (XXXIII. d.). The pupa sharply angularly pointed at either end, the wing cases nearly at right angles to the axis of the body, forming with the thoracic and fixed abdominal segments a graceful curve, half-pear shaped, the line from the head to outer angle of the wings being twice the length of that from the outer angle to the abdomen at the inner angle of the wing. The remainder (moveable portion) of the abdomen sharply tapered. The pupa with a slight dorsal, lateral, and ventral keel. The second thoracic segment slightly humped dorsally. The dorsal portion of the pointed head brownish, this colour running back for from one to two millimetres along the dorsal and lateral keels. There is a spot of the same colour at the base of the wings, on the abdomen above the inner angle, and laterally at the junction of the fifth and sixth abdominal segments. The black setae of the larval stage reappear as minute black spots, the anterior trapezoidals being more prominent. The dorsal ridge or keel of a slightly more yellowish colour, the lateral ridge less coloured, clearer, especially so at the anal end. Suspended from the cremaster from a pad of silk and girdled across the centre of the wing cases.

When nearing emergence the area around the "hump" on the dorsal face of the mesothorax becomes more bluish, wing cases strongly yellowish. About 36 hours later the wing apices become black.

Described from a single larva found on a species of *Cassia* (on which plant it is difficult to see), at Guayapa near Patquia, Prov. of La Rioja, Argentine, during the third week of February, 1931. The insect remained in the pupal state 7 days.

Colours from Ridgeway's Color Standards and Nomenclature, 1912.

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Desiderata.—*Hyale*, *Welsh aurinia*, *Polychloros*, *Tiphon Agathina*, *Lunigera*, *Lucerneae*, *Neglecta*, *Diffinis*, *Populeti*, *Gothica v. gothicina*, *White Leporina*, *Tridens Putrescens*, *Littoralis*, *Typhae v. fraterna*, *Rurea v. Combusta*, *Gilvago*, *Fulvago v. flavescens*, *Liturata v. nigrofulvata*. Harold B. Williams, Woodcote, 36, Manorgate Road, Kingston Surrey.

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Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. January 17th (Ann.), February 7th.

The South London Entomological and Natural History Society, *Hibernia Chambers*, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. January 11th, 25th (Ann.).—Hon. Secretary, S. N. A. Jacobs, "Ditchling," Hayes Lane, Bromley, Kent.

The London Natural History Society.—Meetings first four Tuesdays in the month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through Members, or from the Hon. Sec. A. B. Hornblower, 91, Queen's Road, Buckhurst Hill, Essex.

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